TECHNOLOGY DEPT:

January 24, 1940

NATIONAL PETROLEUM NEWS

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DETROIT

Neil MacCoull

Newly elected vice president of the Society of Automotive Engineers representing Fuels and Lubricants Engineering is a Texas Company engineer.

REFINING TECHNOLOGY EDITION

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They Always Work

TOKHEIM OIL TANK & PUMP CO.

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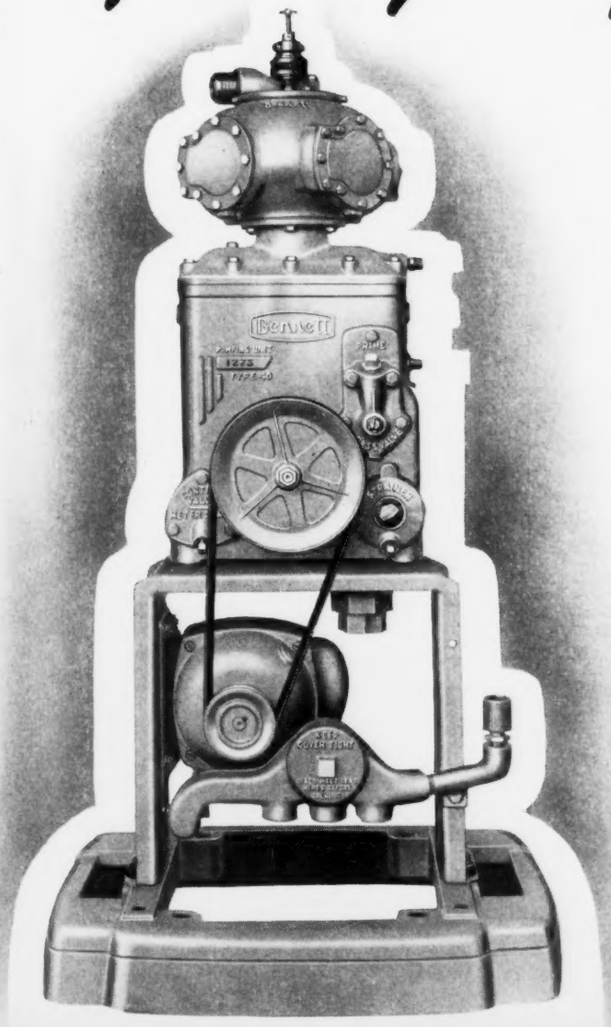
FOR 39 YEARS

FORT WAYNE INDIANA

QUALITY TOKHEIM
COSTS LESS TO MAINTAIN

completely Engineered Pump!

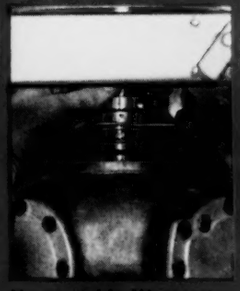


Bennett

Pyramid Construction

BENNETT'S master engineers top all former achievements in this new, compact, centerline balanced unit. A service man needs only one look and he wonders why it wasn't done years ago. So logical, so sturdy, so simple and easy to handle. Now, after seeing the BENNETT PYRAMID on its own base, independent of the housing—he wonders why, in the past, these important mechanisms were ever attached to the framework.

New Combination 3-Bulb Fixture and Light Switch—very accessible.

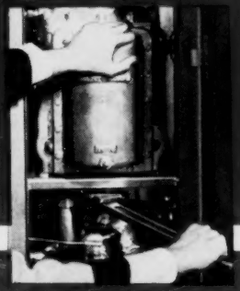


New outside Micrometer Motor adjustment easily and accurately made—32 seconds to adjust.

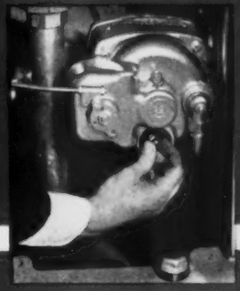
By-Pass Valve Assembly entirely removed in 32 seconds.

New outside By-Pass Valve Adjustment—32 seconds to adjust—no loss of gasoline.

Motor Belt slack taken up by adjustable Sheave Pulley—16 seconds to adjust.

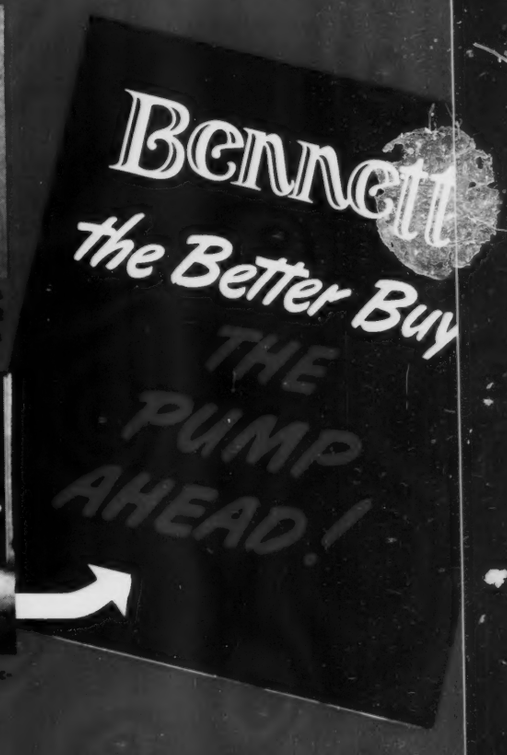


Plenty of room for connecting Suction Line, Union 16 inches above floor



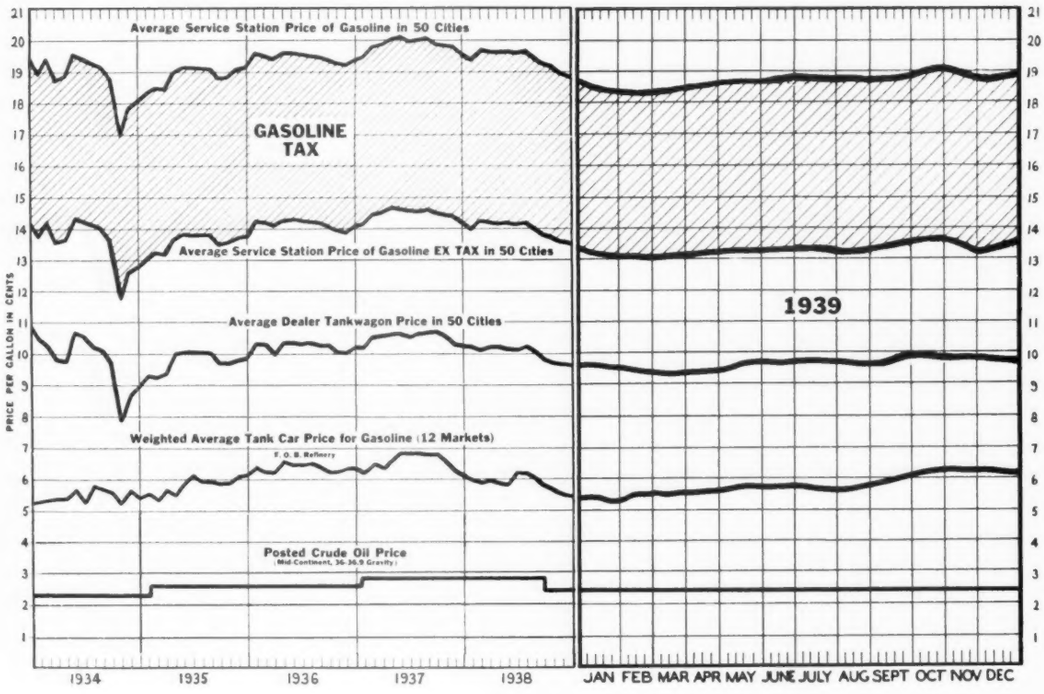
110 or 220 V Selection easily made in 10 seconds.

Junction Box high and accessible.



SEND FOR THE NEW ILLUSTRATED FOLDER

Gasoline Prices Turned Upward in 1939


Average Service Station Price of Gasoline in 50 Cities
GASOLINE TAX
Average Service Station Price of Gasoline EX TAX in 50 Cities
Average Dealer Tankwagon Price in 50 Cities
Weighted Average Tank Car Price for Gasoline (12 Markets)
F. O. B. Refinery
Posted Crude Oil Price
(Mid-Continent, 36-36.9 Gravity)
PRICE PER GALLON IN CENTS
1939
1934
1935
1936
1937
1938
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

Net Change 1939—

	Cents per gal.
Tank car price	+0.69
Tank wagon price to undivided dealers	+0.17
Average service station price	+0.19
Prevailing posted price Mid-Continent crude	unchanged

The weighted average tank car price of regular grade gasoline in 12 markets as reported regularly weekly by NATIONAL PETROLEUM NEWS, was 6.10 cents a gallon Dec. 30, 1939, as compared with 5.41 cents Jan. 2, 1939. Lowest price for year was 5.37 Jan. 29 and Feb. 5, while the highest was 6.28 Oct. 14.

Average tank wagon price to the undivided dealer, for 50 cities, was 9.78 cents Dec. 30, 1939, as compared with 9.61 cents Jan. 2. Lowest price was 9.35 cents in late February, March and early April; highest price was 9.85 cents the middle of October.

Average service station price for regular gasoline in 50 cities on Jan. 1, 1940, was 18.95 cents, as compared with 18.76 Jan. 1. Highest price was 19.07 cents Nov. 1.

Average amount of gasoline tax motorists paid throughout 1939 was 5.44 cents.

Prevailing posted price of Mid-Continent 36-36.9 gravity crude oil was unchanged at $1.02 a barrel throughout 1939. Some companies reduced their prices 20 cents a barrel starting Aug. 10 but restored them to the prevailing level Aug. 31.

NATIONAL PETROLEUM NEWS

VOLUME 32 WEDNESDAY, JANUARY 24, 1940 NUMBER 4

Pipeline Sues, Charging Plot To Block Line

ATLANTA, Ga., Jan. 22.—Charges of conspiracy in violation of U. S. anti-trust statutes were filed in federal district court here against seven southeastern railroads by Southeastern Pipe Line Co. last week as pipeline officials encountered "difficulties" in obtaining rights of way for the laying of their gasoline line from the Florida Gulf Coast to Atlanta and Chattanooga.

Pipeline's Charges Listed

Main interference alleged in the conspiracy charges refused to permit the pipeline to cross railroad rights-of-way and have used their influence with railroad employes and individual property owners in obtaining their support against sale of rights-of-way and in requesting state officials not to issue permits to the pipeline to cross public property. In short, the suit alleged that rails "conspired" to interfere with construction of the new pipeline because rails objected to pipeline competition. For this, Southeastern Pipe Line Co. asks triple damages amounting to $450,000.

Rails Get Injunctions

In the meantime, "half dozen" railroads have obtained temporary injunctions in local superior courts last week restraining Southeastern Pipe Line Co. and its contractors from violating rails' rights of way, one railroad spokesman told NATIONAL PETROLEUM NEWS.

Another railroad spokesman last week told how rail employes had organized committees to present to railroad unions, city and county officials and private property owners the rails' side of the pipeline controversy. The rail official said they were stressing the "losses" that would result to the railroads by construction of the line, the "important place" of the railroads in the payment of taxes and business life of the state and county.

Governor Rivers of Georgia has entered into the rail-pipeline controversy, according to

(Continued on page 17)

Cole Committee Member Attacks Federal Control of Oil Industry

By N.P.N. Staff Writer

LOS ANGELES, Jan. 20.—Although California oil men were emphatic in their opposition to federal control of the oil industry, according to testimony in the three-day hearing here the past week by the Cole oil subcommittee, the most vigorous criticism of the New Deal came, not from an oil man, but from a member of the committee itself.

This committee member, Rep. Pehr G. Holmes, Massachusetts, took issue with his Republican colleague, Rep. Charles A. Wolverton, New Jersey, who in the course of his searching questions had criticized oil shipments to Japan because of Japanese bombing of Chinese cities.

At the word "Japan", Mr. Holmes, who filled the vacancy on the committee caused by Rep. Mapes' death, shot a quick glance at the audience of more than 200 oil men, and started firing.

"How can we stop shipments to any country and still remain neutral?" he asked.

"As I understand the Neutrality Act," said the Massachusetts congressman, "the President is authorized to declare which are aggressor nations and until then, they are neutral. Placement of a California embargo on oil shipments to Japan, for instance, would be an unneutral act. What action can we take as neutrals until the neutrality act is invoked by the President?"

Opposes Federal Control

Implying that he was strongly opposed to federal oil control legislation being studied by the committee, of which he is a member, Mr. Holmes said "federal domination and dictatorship in this country must cease."

California, like every other state in the union, is being made to suffer from industrial control from Washington, Mr. Holmes charged. To show the extent to which the New Deal has entered state politics, Mr. Holmes cited President Roosevelt's effort last November to convince people in California

Two 'Members' Sit In On Cole Hearings

LOS ANGELES, Jan. 20.—Although it was denied, both here and in Washington, that Reps. Crosser (Dem.), Ohio, and Wolfenden (Rep.), Penna., had been appointed on the Cole oil subcommittee, both congressmen participated in the subcommittee's hearings here.

Gov. Phillips Heads Compact

By Telegraph
By N.P.N. Staff Writer

WICHITA, Kans., Jan. 22.—The Interstate Compact Commission at its quarterly meeting here today elected a new chairman and a new vice chairman, studied the current refined and crude oils stocks position and mapped plans to oppose the proposed Cole federal oil control bill when the Cole subcommittee opens hearings in Washington beginning Feb. 5.

Gov. Leon C. Phillips of Oklahoma was unanimously elected chairman of the compact commission. He succeeds Col. Ernest O. Thompson of the Texas Railroad Commission and the Texas representative on the compact commission. Col. Thompson who has had the chairmanship three terms nominated Gov. Phillips.

A. F. Schoeppel, chairman of the Kansas Corporation Commission, was unanimously elect-

(Continued on page 20)

A.P.I. Appoints Committee For Marketing Activities

NEW YORK, Jan. 22.—The executive committee of the American Petroleum Institute Jan. 17 approved a plan to revive the marketing activities of the Institute, along the lines on which work in other divisions of the oil industry is organized. It also appointed a general committee for 1940 of the Division of Marketing.

The program for marketing approved is an outgrowth of the discussion at an open meeting of the old general marketing committee last November, at the annual A.P.I. meeting in Chicago. Criticism was expressed there of the lack of attention given by the Institute to marketing problems.

Eric V. Weber, Cincinnati, head of the Eureka Oil Co., vice president of the A.P.I. for marketing, was authorized by

(Continued on page 16)

Eric V. Weber

Cole Committee Hears California Governor

Congressional oil subcommittee hears Gov. Olson of California (at extreme right, standing) at Los Angeles hearings. Subcommittee, from left to right, is comprised of: James Wolfenden, Pa.; Robert Crosser, Ohio; Edward A. Kelly, Ill.; William P. Cole, Jr., Md., chairman of subcommittee; Charles A. Wolverton, N. J.; Herron Pearson, Tenn.; Pehr G. Holmes, Mass. Clarence F. Lea, Calif., chairman of Committee on Interstate and Foreign Commerce, of which Cole and members form subcommittee, accompanied group to Los Angeles, but is not shown in the picture

that the Atkinson Bill (for state proration of oil production) was to their advantage.

Until nations, to which California is shipping oil and other products, are declared by the President to be "aggressor nations," neither California nor the oil industry itself has any right to prevent such commerce, Mr. Holmes said.

Until these shots were fired by the heretofore-reticent Mr. Holmes, there was no indication that the Massachusetts industrialist, who made reference to the National Industrial Recovery Act as "the National Industrial Racketeering Act," was seated atop a powder-keg. Furthermore, he praised the oil men for their "individual initiative and enterprise" and said, "I don't wonder at your fear of government power in the oil industry."

Olson Opens Testimony

West coast oil hearings were opened last Tuesday by California's Governor Culbert S. Olson, who said that recent defeat of the Atkinson Oil control bill (NPN, Nov. 15, 1939) indicated that people of this state wanted neither state nor federal control of oil.

However, the Governor stated that personally he had favored the Atkinson Bill. Moreover, he attributed defeat of the bill to confusion and lack of knowledge on the part of the voters, rather than to a desire to prevent state control.

When Mr. Wolverton pointed out that oil control laws in other states seemed to point to a similar need in California, Mr. Olson concurred.

Additional questioning of Governor Olson by the committee brought out the Governor's strange lack of knowledge about the 10-year existence of the California oil industry's voluntary curtailment program. Oil men regarded this particularly odd in view of the fact that Mr. Olson has been closely associated with the state government, prior to attaining his present office, and has always evidenced much interest in this state's oil industry.

Mr. Wolverton concluded questioning of the governor by stating "I've never been one to go out of my way to suggest federal control where state control was adopted."

'Let Industry Decide'

Governor Olson said that he was willing to let the oil industry decide for itself whether or not it wanted enactment of the Cole bill for federal control.

Harold Morton, secretary of Independent Petroleum Producers and Consumers Ass'n, and representative for the California Stripper Well Ass'n, was the second witness on the opening day.

Stating that California already possesses adequate conservation measures, Mr. Morton referred to the Cole bill, and said:

"We do not want political commissars in this country, as this leads to Communism and Naziism, and I do not differentiate between the two."

'Could Create New Crimes'

Furthermore, it was Mr. Morton's belief that the petroleum commissioner, who would come into existence with the passage of the Cole Bill, could make a new list of crimes overnight. To substantiate this statement, he cited California's experience with federal control in the NIRA oil code days.

Questions about the defeated Atkinson Bill came with the same regularity as the "Wolverton Quizz." It was brought out while Mr. Morton was on the stand, that the Independent Petroleum Producers and Consumers Ass'n, of which he is secretary, was organized for the purpose of defeating the Atkinson measure.

Third witness was Lawrence Vander Leck, chairman of the Central Committee of California Oil Producers, who gave a picture of this state's method of crude production. When Mr. Wolverton inferred that consumers should be represented on the Central Committee, this suggestion met with no opposition from Mr. Vander Leck.

Voluntary Program Explained

L. L. Aubert, chairman of the allocation committee, explained the technical angle of determining the state's allowable under the voluntary proration program which, for the past three months, has been 599,000 barrels daily.

Although the hearings up to this point were far from the edge of boredom, testimony of the following two witnesses did much to enliven the second day's session.

John R. Pemberton, umpire under the voluntary curtailment program, said, in effect, that there was no need for production control in California, adding that there was a greater degree of co-operation than in any other oil state.

Regarding shipping to Japan, Mr. Pemberton said that the federal government had showed a reluctance to order a halt because, he added, that would be tantamount of declaring war. If the federal government doesn't see fit to issue such orders, oil producers themselves shouldn't be asked to stop such shipments, he added.

Loses Enthusiasm for New Deal

When Mr. Pemberton testified before this committee in 1934, he expressed the opinion that federal control was advisable. Asked to account for his change of mind since that date, the umpire said "the enthusiasm some of us had in 1934 for the New Deal led us far afield."

Brought out in Mr. Pemberton's testimony was California's present crude reserves, estimated at 3,160,000,000 barrels, excluding naval reserves at Elk Hills. The oil umpire emphasized that increased price for

oil would make possible larger expenditures for prevention of so-called subsurface waste.

Sick of Hot-Dog Lawyers

Dana Hogan, president of the Hogan Petroleum Co., and of the San Joaquin Valley Oil Producers Ass'n, went on record as saying that lack of confidence in the Department of Interior had made oil men "sick of dealing with 'hot-dog' lawyers one or two generations removed from Russia, but still nurturing Russian tendencies."

As evidence that the oil industry on the West Coast is capable of protecting the consumer without resorting to politics Mr. Hogan pointed out that service has been greatly improved and that the voluntary curtailment program is a success.

Sees Marketing Control Move

Mr. Hogan saw in the Cole Bill an eventual attempt to control marketing, and said that this indicates a desire on the part of those who wrote the bill to control all phases of the industry. His view of this situation was epitomized by the oil man in the following remark:

"What chance has a little fellow in a one-sided shell game like this?"

Enough oil for at least 110 years was cited by Mr. Hogan, who, at one point in his testimony, stated that there might be enough oil in this country for 10,900 years, and he did not think that the Cole committee should concern itself with the year 12840.

Criticism of the Venezuela treaty, by this same witness, was largely on the ground that the federal government went ahead with the proceedings and failed to ask the opinion of West Coast independents, whose sales of asphalt and Santa Maria crude were said to be effected by the cut in the oil import tax from 21 cents to 10.5 cents a barrel in this trade agreement.

As Mr. Hogan enumerated his points according to the letters in the alphabet, Rep. Wolverton humorously observed that "your alphabetical manner rivals the New Deal."

Next witness was W. B. Wylie, executive secretary of the Retail Petroleum Dealers Ass'n, who said that any rise in the price of crude would mean less charging stock for the small refineries, and consequently a rise in price of gasoline for the 800 members of his organization.

When questioned about the stand taken by his association on the Atkinson Bill, Mr. Wylie said it was favored "as the lesser of two evils"—meaning state or federal regulation.

On the final evening's session, Thursday, C. A. Johnson, a vice-president of the Oil Producers Agency of California, declared that federal oil control would retard the progress of the industry.

Lorin A. Cranson, vice-president and director of the Honolulu Oil Corp., and Kettleman Oil Corp., Ltd., stated that he had favored Atkinson Bill but was against federal control.

In reference to Japanese ship-

Loses Enthusiasm for New Deal

J. R. Pemberton, California oil umpire, uses lapel microphone so that the Cole Committee and the 200 oil men present can hear his views

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ments, Mr. Cranson stated that it was not certain California's curtailment program would work with the loss of the Nippon market. When Mr. Wolverton asked him if he favored shipments of oil to those countries using it to annihilate defenseless civilians, Mr. Cranson pointed out that if America did not sell this commodity to Japan, other countries would, and that as far as he was concerned, copper, scrap iron, and other munitions, were in the same category as oil.

Oil men who did not appear, but who filed statements with the committee, were W. C. Whaley, vice-president of Barnsdall Oil Co.; and E. B. Hall, president Hall-Baker Co.; W. W. Porter, consultant geologist, also filed his statement.

Kluth Favors Federal Control

Emil Kluth, vice-president of George F. Getty, Inc., and of Pacific Western Oil Corp., was about to follow suit in the filing of his statement, due to the fact that Chairman Cole indicated lack of time for another hearing, when Mr. Kluth said that he was one oil man who favored federal control.

Following long laughter by both audience and the committee, Mr. Cole said it might be well to hear Mr. Kluth in order to educate those disapproving the federal measure.

Briefly, Mr. Kluth's reasons for favoring federal control were based on his statement that a certain refinery in the Southern California area was disposing of large amounts of residue unnecessarily. Moreover, he stated that pipelines, which for the most part are owned by the major companies, should be common carriers, otherwise it is hard for independents to sell their oil.

Mr. Wolverton mentioned the failure of any representive from California's seven major oil companies to make an appearance. No light was thrown upon this matter.

Lea Explains

Rep. Clarence F. Lea (Calif.), chairman of the Committee on Interstate and Foreign Commerce, of which the Cole group is a subcommittee, concluded the California hearings by reading a statement to the effect that the sole purpose of the federal investigation regarding federal oil legislation was to ascertain whether or not it was needed.

On the morning after the three-day session of hearings, committee members left Los Angeles by automibile to visit oil fields in Santa Barbara, Kettleman Hills, Santa Maria, and Yosemite, enroute to San Francisco. But no hearings will be held in the Bay City.

Aviation 'Gas' Exports Draw Attention of U. S.

N. P. N. News Bureau

WASHINGTON, Jan. 22. — Exports of American petroleum and products to Japan and Russia, already being eyed by groups within both legislative and executive branches of the federal government, are scheduled for an even more careful scrutiny during the next few weeks.

Primary reason for this interest of the federal government, which may result in some sort of curtailment of the recently increasing shipments, is of course the wars in which both Japan and Russia are engaged—the former with China; the latter with Finland—and while the U. S. is nominally "neutral", President Roosevelt has frequently spoken of steps "short of war" which might be taken against aggressor nations. Curtailment of shipment of vital war supplies might be regarded as such a "step".

Chairman Key Pittman, Nev., of the Senate Foreign Relations Committee sponsored a resolution at the last regular session of Congress to embargo shipments of war supplies—including scrap iron and oil—to violators of the Nine-power agreement guaranteeing the territorial integrity of China.

Aimed at Japan

The resolution was clearly aimed at Japan, because of her invasion of China, but when the State Department was asked for its recommendation with respect to the embargo, Secretary Hull pointed out the existence of a trade treaty, effective for some 30 or more years, between this country and Japan. Application of an embargo on shipments to Japan while the treaty remained in effect would have been construed as a treaty violation, the Department said, adding that the treaty expired on Jan. 26, 1940. After that, it was inferred, the committee might take action on the Pittman resolution.

Although Japan's diplomatic representatives here have been conferring with State Department officials over possibility of renewing the treaty, or at least making some provision for temporary continuance of the status quo, no definite agreement has been reached. However, lapse of the treaty will have no positive effect upon trade between the two countries unless some definite steps are taken by one or the other, such as declaration of an embargo.

Chairman Pittman's committee will begin consideration of his embargo resolution sometime next week, after expiration of the treaty (if, indeed, it is allowed to expire), and at the same time will have before it several other proposals.

Resolutions Introduced

Chief among these others are the resolutions offered within the past week by Senators Danaher, Conn. (S. Con. Res. 35) and Gillette, Ia. (S. Con. Res. 36), which would formally recognize a state of war to exist between Japan and China and between Russia and Finland. Passage of such resolutions would be precedent to application of the cash-and-carry provisions (on all commodities) of the new neutrality law to the belligerents. Under the new law, Congress, as well as the President, is empowered to recognize a state of war, on which recognition the President is to issue a proclamation.

Halts Manufacturing Plans

Already the President has declared a "moral embargo" on exports of equipment, methods, etc., for the manufacture of aviation gasoline to nations which have bombed non-military objectives and open cities (again Japan and Russia), and the State Department has asked those companies which are engaged in such export business, including the construction of aviation-gasoline refineries in these countries, to observe the embargo. It is understood that the compliance is virtually 100 per cent, and that at least one company now building large cracking plants for the manufacture of aviation gasoline in both ccuntries is withdrawing its technicians.

Having thus effectively embargoed the means for manufacturing aviation gasoline, the State Department is now considering applying the "moral embargo" to aviation fuels themselves. Such an embargo would be effected by requesting the exporting companies not to fulfill their existing contracts, nor to enter into any others. Already, it is understood, some exporting companies have been approached on such a request, and the announcement of the embargo may follow the expiration of the Japanese treaty.

However, the large part of U. S. shipments of petroleum products to Japan (estimated as averaging about 77,000 barrels per day during 1939—possibly higher in December) is crude oil—about 60 per cent; and only about 5 per cent is gasoline, not all of which is aviation fuel.

May Cover All Gasolines

At the same time, although it is generally reported that the sharply increasing shipments of gasoline to Russia from our west coast are aviation fuel, official government reports show them to be chiefly "other" gasoline (as differentiated from aviation fuel). Most of the shipments are made via Vladivostok.

It is not at all certain, though, that a "moral embargo", if placed on gasoline, would be solely on aviation fuel, since most of those who favor any kind of embargo are said to consider gasoline used as fuel for tanks and other motorized military units as much a "war supply" as airplane gasoline.

The belief of observers here that the gasoline supplies going to Russia from our west coast are "war supplies", or at least used in Eastern Russia so as to make gasoline in the western part of the country available for military use, is based on the fact that, before her Finnish operations began, Russia was importing virtually no petroleum products from this country, and since the Finnish war started she has taken more than 1,400,000 barrels of gasoline.

Also, it is understood, Army and Navy officials are looking with lifted eyebrows at exports to warring countries, and may also take some part in the general discussion of the subject during the next week or so. The military authorities are said to be satisfied with the potential capacity for production of aviation fuels in this country, as revealed by the Bureau of Mines' first aviation gasoline report, issued last month, and by a survey they themselves made, but are wondering about shipments abroad.

Japan is Dependent on U. S.

Europe's wars — Russo-Finnish and Germano-Allies — are making Japan more than ever dependent upon the U. S. for her supplies of petroleum and products, and it is understood that if Japan's imports from this country were to be cut off the Japanese would have to curtail domestic consumption—after exhaustion of present somewhat-large stocks—to something less than 15 per cent of the present domestic use.

U. S. oil exports to Japan in 1939 constituted about 70 per cent of her total supply, according to government sources here.

MAKE WINTER'S BLASTS SELL YOUR MOTOR OIL

SUB-ZERO weather, that is sweeping a large section of the country, offers the most serious threat of all weather to operating efficiency and continued long life of the modern automobile.

Are you telling your customers what special precautions should be taken to protect the highly finished surfaces of engine and gears during cold weather?

Engine, transmission and differential wear is greatly accelerated, battery life is substantially shortened and gasoline consumption is greater if suitable winter-grade lubricants are not used.

Some cars, which have a Winter Change-Over of lubricants in the Fall, continue to develop trouble in sub-zero temperatures. This is particularly true in transmissions and differentials. This is declared due to failure by some service stations to remove all the old lubricant. A heat gun is usually required to clean the gear cases thoroughly at the time lubricants are changed.

Cold Weather Contaminates Motor Oil

Another factor contributing to excessive engine wear, but one not as well understood by the average motorist or by many station operators, is the accelerated contamination of motor oil by non-lubricating elements in sub-zero weather.

A page from the owner's manuals issued by most car manufacturers points out that natural conditions in all automotive equipment cause constant impregnation of the motor oil with unburned fuel, water and acid which by-pass the pistons into the crankcase and depreciate the lubricating value of the oil—no matter what brand of oil is used.

One of the most objectionable of these contaminating elements is water. Approximately as much water vapor is formed in the combustion chamber of the engine, by weight, as fuel consumed. Although a large part of this moisture is expelled through the exhaust, a percentage escapes into the crankcase.

Water Vapor Condenses in Crankcase

At high speeds and a hot motor, most of this moisture is removed, along with any gasoline vapor, by the crankcase ventilating system. However, under conditions of average winter driving—where cars are driven comparatively short distances, at relatively low speeds and at infrequent intervals—this moisture condenses in the cold crankcase to form in the motor oil a particularly vicious type of oil emulsion or sludge.

Accumulation of these non-lubricating elements in the engine oil have, according to car manufacturers, damaging effects on the highly finished steel surfaces.

Fuel thins the oil and in some instances forms a lead precipitate, reducing its lubricating ability. Water, in addition to forming a sludge which clogs oil screens, lines and filter, is likely to freeze and stop oil circulation.

Sulphurous acid, formed when vapors from combustion of gasolines containing sulphur unite with water, attacks steel surfaces and causes excessive wear.

The rapidity with which these contaminating substances accumulate increases as the atmospheric temperature decreases. That is why car manufacturers recommend more frequent motor oil drains in cold weather. In conditions of extreme cold—such as sub-zero temperatures—intervals of less than 500 miles between drains are recommended.

Flushing Crankcase Also Required

To thoroughly clean the engine of sludge and other substances which would be left in the crankcase and contaminate the new oil, more than the usual drain is required. Cleansing with flushing oil and forced spray is an essential service for proper engine lubrication in cold weather.

Sub-zero temperatures experienced last week in 24 states, from Montana to Maryland and as far south as Alabama, affected owners of approximately 15,000,000 passenger cars, or about three-fifths of total automobile registration.

Sub-Zero Temperatures in 24 States

These are located in the following states, all of which reported sub-zero temperatures as follows:

Montana	—31	Kentucky	—14
Idaho	—30	Alabama	—3
Wyoming	—32	Tennessee	—5
Colorado	—10	Michigan	—6
North Dakota	—26	Ohio	—14
Nebraska	—28	Illinois	—14
Minnesota	—23	Pennsylvania	—6
Iowa	—25	Maryland	—7
Wisconsin	—27	West Virginia	—5
Missouri	—12	Indiana	—10
Oklahoma	—1	Kansas	—18
Arkansas	—5	New Jersey	—5

Cold Spell Offers Sales Opportunities

With indications that the "cold spell" will continue to bring temperatures of zero or below for some weeks to come, oil marketers have promise of the biggest sale of winter lubricants in history—provided they make the effort necessary to create this new business, and have the proper facilities.

Many marketers reported a land office business on the day of the "Big Freeze" last week, with a large number of station operators getting no more than a "cat-nap" in 48 hours as they helped out motorists who had continued to use unsuitable or contaminated lubricants.

Follow-up notices to car owners should go out immediately, warning against the dangers of contaminated motor oils and the special need for winter-grade lubricants.

K. O. M. A. to Meet Feb. 12-13

WICHITA, Kan., Jan. 19.—Twenty-sixth annual convention of the Kansas Oil Men's Assn., will be held at the Broadview hotel, Wichita, Feb. 12 and 13, President E. M. Taylor has announced.

The association's board of directors at a recent meeting adopted a resolution opposing passage of the Cole oil bill.

Senate Postpones Action on Mexican Bills

WASHINGTON, Jan. 22. — Senate has indefinitely postponed consideration of Senate Resolution 174, providing for an investigation of negotiations by American citizens with the Mexican government concerning sales of Mexican oil subsequent to the Mexican expropriation. It is expected that the expropriation situation will be handled otherwise.

The Editor's Page—

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT, Editor and Publisher, Penton Building, Cleveland, O.

Keep 'Surplus' Gasoline in the Refineries So Sales Departments May Get Fair Prices

A most constructive view of alleged "surplus" gasoline stocks was given the oil industry at the State Compact meeting at Wichita, Kans. this week by Dr. A. G. White, of the U. S. Bureau of Mines. If that view is taken by every oil executive, big refiner and Independent, there would seem to be little chance for management forcing those seemingly extra stocks onto their sales departments with instructions to get rid of them regardless of price. The holding of this constructive view by the industry generally should assure reasonable refinery prices.

Dr. White said that crude oil stocks are at a minimum for actual working stocks. The unexpected increase in gasoline stocks, he said, had come about through the severity of the winter causing an increase in demand for kerosine and distillate of 10 per cent whereas gasoline demand had risen but 5 per cent or 6 per cent. He thought that the 10,000,000 bbls. of additions to gasoline stocks are not excessive. He recommended refiners cutting down their gasoline yields and thus increasing their kerosine and distillate output.

NPN's editorial of two weeks ago that any "surplus" of gasoline stocks was either due to faulty refinery operation or management ordering surpluses thrown on the market regardless of whether the market could absorb them at reasonable prices, has aroused much favorable comment. Much of it will be printed next week. The comment develops that some major companies, at least, hold strictly to the policy of the sales department giving the refinery department its proposed quota of products, which when agreed upon by the management, becomes the standard for refinery operation. When the refining department exceeds that standard it is the refining department's fault and trouble and the management refuses to require the sales department to get rid of the excess produced in error or by inadvertence, knowing that any such action will bring down the tank car markets.

All that SHOULD affect price is what the sales departments are called upon to sell, not what the refining or crude oil departments happen to manufacture or produce. Yet for years statistical surveys of the oil industry have been presented on the assumption that the minute a barrel of oil is produced or a gallon of gasoline is manufactured they are IMMEDIATELY OFFERED for sale in the markets. No doubt they have been largely in the past, but today we know of some companies, at least, where that is not true and one can see no reason for believing that it should be true in other companies.

We grant that an excess of anything produced or manufactured is a potential threat to price but what is MANAGEMENT for if not to see that those excesses do not happen, or if they do occur that they are not permitted to go on the markets?

The days of the small hand-to-mouth refiner are past. He manufactured only to ship the minute the stuff was cool enough to load and he did not always wait for his products to cool to a decent temperature. It is hardly conceivable that major companies operate on any such basis and it is ridiculous for the industry to keep on thinking that they do when the industry looks at some statistics.

Today's gasoline stocks are almost entirely in the tanks of major oil companies. Some of the smaller refiners have been hard put to it to take care of an unexpectedly large heating oil demand due to the extreme severity of the winter and others, down on the Gulf Coast, have had their disappointments over the irregularity of tankers arriving due to the war.

But none of these factors say that gasoline is worth at the refinery today less than is being asked for it. In fact prices probably should be higher.

If the excess of stocks and the difficulties of meeting an unexpected heating oil demand and lopsided tanker schedules, can be kept within the refining departments where they belong, there would seem to be no reason in the world why the sales departments cannot ask and obtain fair prices for all products.

If fair refinery prices can be obtained and firmly adhered to, some, at least, of the marketer's and retailers' price troubles might be avoided. A weak tank car market, with first one and then another refiner secretly offering concessions, is generally quite promptly reflected in the retail prices as the buyers of these products undertake to cash in on their price advantages in the battle for gallonage.

The idea seems to be percolating into congressional minds that the only way to work ourselves out of this depression and from under the ever growing pile of debt, is for industry to have profits, good profits, and be allowed to keep a good share of those profits for improvement and expansion, as well as for dividends.

May the oil industry, every company in it, enjoy such profits for 1940, for its own good and for the public good.

Realization of this hope would certainly seem possible if the industry but considers "surplus" stocks as an error in a refinery operating schedule and keeps those stocks in the refining departments, and not give them to the sales departments with command to sell them regardless of price.

Ickes 'Censorious' Purge And His Use of Political 'Perquisites'

Interior Secretary Ickes in his campaign for the enactment by Congress of the Roosevelt-Ickes Oil Industry Control Bill (the so-called "Cole Bill") is invoking some of the strictly political perquisites that his office can command.

He is "accepting"—perhaps even on his demand, who knows?—an hour a week on a national radio broadcasting system and without charge to him, in which to "plug" his office, his administration and above all his and Roosevelt's oil control bill. One of the great objections to the present status of radio, existing on a short-time permit from a government agency, is that it would make it quite susceptible, to say the least, to the desires of the administration that can give it continued life or sudden death.

Second, our late Oil Administrator who so badly fumbled oil conservation when he had his big opportunity at the time of the late code, seems to get this broadcasting time free of any censorship as to the truth and accuracy of the statements made thereon, let alone the fairness of the statements.

Ickes' broadcasting skits continually emphasize conditions and practices that existed years ago in the oil industry, as

reasons for his demand for today's oil control legislation. When these same broadcasters refer to other mineral industries and their wasteful practices of early days, they always gloss over such "wastes" as being necessary but incidental to pioneer development.

One of these much favored early "wasteful" industries is coal, which is now 100 per cent under Ickes' control as to production, methods and prices. It also is the industry whose dominant labor union donated a half million dollars to Roosevelt's campaign fund when it was low. This is the same labor union as is headed by "C. I. O." Lewis and which "C. I. O." has received so many favors these years from government boards and officers, and many prominent "leaders" of which the Dies Congressional Committee have declared are Communists.

That the oil industry has overcome its early pioneering wasteful practices, just as other pioneering industries, as rapidly and to the extent that engineering minds have been able to devise means and the laws of the country permitted, is a fact which the Ickes' broadcasters ignore.

We have no doubt but that if any major oil company—or oil association—which of course would have to pay hard money for the broadcasting time—put the same kind of unfair and untrue picture out over the air about Ickes' conduct, there would be as great a ruckus as Washington has seen even in these tempestuous days. In fact if such a broadcast even told the truth about Ickes and the administration's conduct in regard to oil, there undoubtedly would be a ruckus, so unpleasant would be the picture presented.

A third of Ickes' political perquisites that he has invoked, is the "purge" of employes who do not see eye to eye with him and the administration regarding the oil control bill. Already the Director of the Bureau of Mines has resigned under pressure because he is not in favor of this particular kind of a bill. Report has it others will depart from the government payroll unless, presumably, they change their views.

Ickes, as head of the Interior Department, overlooks the fact that the Director of the Bureau of Mines and these other employes in his department are public servants, employed by all the people, paid for by public taxes and, presumably, are working for the interest of all the people. They are not supposed to be hired, or retained, only because they are supporters of the New Deal and any of Ickes' personal ideas. These men have been the public's servants for years and the public is entitled to have the benefit of their honest opinions on the facts that they have had to do with during their official activities. If these public servants happen not to agree with any of their superiors in regard to conclusions from facts at their command, that is their prerogative and it is what the public is paying them for.

If all our public servants, especially those in technical work such as the Bureau of Mines is engaged in, are to be bullied into parroting the views of their political superiors contrary to their professional opinions as public servants, then this country is not the democracy of the kind Ickes talks so much about.

The Roosevelt-Ickes Oil Control bill has raised in dramatic fashion the big issue of what kind of government we shall have. This issue has hung over Washington for years, even long before the coming of the New Deal. This issue is, can the people best govern themselves through placing unlimited power in the hands of a few men thousands of miles removed from the voters, or are the citizens better off to put such power to govern as close at home as possible, within the state or even within the county, where more of those governed will know the governors and have readier access to their offices and ears?

The governors as well as other public officials and citizens of the great oil producing states, have appeared before the Cole congressional committee holding hearings over the country on this oil control bill. They have condemned the proposed transfer of governing authority over the oil producing business to Washington. They have contradicted and refuted the unfair and untrue statements issued by those at Washington in support of the bill. And above all these opponents from the oil states have shown that, Democrats though many of them are, they are not going to surrender any of their rights and the rights of the citizens they represent, on the demand of those seeking to place totalitarian government in the marble palaces at Washington—palaces also paid for by long-struggling citizens.

Around THE MID-CONTINENT

. . . By ALLEN S. JAMES

Tulsa had three possessions back in the first decade of the present century which pioneer oil and business men now say were major factors in putting the city on the road which eventually led it to the point of being the oil capital of the world.

Those three possessions were:

1. A good hotel—The Robinson hotel at Third and Main streets.

2. The five-story "skyscraper" office building at Second and Main streets.

3. A bridge across the Arkansas river.

The good hotel is no longer that. It isn't even a hotel but a very sparsely tenanted office building with shops occupying the once spacious lobby which long ago was partitioned into store buildings.

Today Tulsa has many good hotels, among them the Mayo having 18 stories and over 500 rooms and the Tulsa with some 14 or 15 floors and almost 400 rooms and a number of apartments.

The bridge across the Arkansas river, which let the oil men get to the newly-discovered oil fields over around Red Fork, Beggs and Keifer and other spots, long since has been torn down. But now there are two bridges across the river at Tulsa and one at Sand Springs, only seven miles west of Tulsa.

And now the last of the three major possessions has given way to progress. The "skyscraper" at Second and Main streets, now called the Security Building, will be little more than a monument to those early days after Feb. 1 because an insurance company which now owns it has notified its 12 tenants to vacate by that date. The company finds the maintenance service costs more than it can get from rentals.

But that old building was a source of joy and pride to Tulsa in its day. Back in 1905 and 1906 when it was erected it was called the finest office building in the then Indian territory. It was the "First National Bank" building then—the financial and oil center of the city.

Now the First National Bank has its own building at Fourth and Main streets, almost three times as tall as that first building. Other larger and taller office buildings have been erected "farther uptown." The Philtower and the National Bank of Tulsa building, are 22 and 23 stories tall, respectively. The Cosden building is 18 stories, the Thompson building 17 stories and there are any number that are from two to three times as tall as that first "skyscraper."

Illinois Hits 366,700 Bbls.

NEW YORK, Jan. 23.—Illinois production averaged 366,700 bbls. daily in week ended Jan. 20, up 29,300 bbls. from the previous week, and a new all-time high, according to report of the American Petroleum Institute today. Previous high in Illinois production was 343,900 bbls. daily in week ended Sept. 30, 1939.

U. S. daily average output increased 45,250 bbls. to 3,637,450 bbls. last week. Kansas increased 9150 bbls.; Texas 7500; and California 6700.

Cole Witnesses Listed

N. I. N. News Bureau

WASHINGTON, Jan. 23.—Governors of four oil producing states have told the Cole subcommittee they will be present or represented at the committee's hearing on the Cole oil bill (HR 7372) beginning Feb. 5 here.

Only Governor Ratner, Kansas, indicated he will be at the hearing in person. Governor Phillips of Oklahoma has said he will send a representative, not yet named. Michigan's representative will be P. J. Hoffmaster, director of conservation. New Mexico will have three representatives, Hiram Dow, for Governor Miles, A. A. Andreas, state geologist, and Glenn Staley, proration umpire.

The committee is scheduled to arrive back in Washington Jan. 25.

Pipeline Filing Date

WASHINGTON, Jan. 22. — Date for filing of exceptions to the report of Interstate Commerce Commission Examiner J. Paul Kelley in the pipeline rate investigation has been extended to Feb. 1, it was learned at the commission today.

Marketing Division Organized by A.P.I.

(*Continued from page 9*)

this meeting to name a conference committee to make recommendations for activities of the marketing division. The conference committee met in New York on Dec. 7 and drew up the program, which was presented last week to the executive committee by W. R. Boyd, Jr., A.P.I. executive vice president. Principal points were:

1—Appointment of a general marketing committee for 1940, with 25 members, in addition to Mr. Weber as chairman, Mr. Boyd as vice chairman, and D. V. Stroop, of the Institute's New York staff, as secretary.

2—Appointment of four regional sectional marketing committees, an advisory committee on regional committees, a standing program committee, and a committee to consider a code on oil marketing practices and be prepared to offer its services to the Federal Trade Commission in connection with a Trade Practice Conference, if one is sponsored by the trade commission. Members of these committees are to be named by the general committee.

3—Functioning of the Institute's Lubrication Committee as a committee of the A.P.I. Division of Marketing, and reporting to the general marketing committee. The special committee on Oil Change Practice of the Lubrication Committee at the annual A.P.I. meeting proposed to sponsor a program to educate motorists to the need for changing crankcase oil at recommended intervals, as a means for protecting their cars. This program was approved by the Institute's executive's committee at the time of the annual meeting. It thus becomes one activity of the Institute's marketing division.

Four Regional Committees

The four regional committees as proposed are to have headquarters at New York, Chicago, New Orleans and San Francisco. The chairman of each is to be a member of the general marketing committee. Membership is to be representative of the petroleum marketers in each region, but not to exceed 25 in number. Members of the regional marketing committees must be members of the A.P.I. and of the Institute's division of marketing.

It is recommended the regional committees hold quarterly meetings and invite other marketers to participate, but that the vote on any question be limited to members. The regional committees have no authority to take action on any oil industry policy or to adopt resolutions other than recommendations to the institute.

The advisory committee on regional activities is to consist of the four members of the general marketing committee who serve as chairmen of regional committees. The standing program committee, to consist of three marketers and two lawyers, who select topics and speakers for the meetings and review papers and prepared discussions.

It had been brought out by A.P.I. Vice President Boyd, at the meeting of the conference committee on marketing Dec. 7, that there appeared to be a strong probability then that the Federal Trade Commission would call a Trade Practice Conference on a code on oil marketing practices within a reasonable time. As a result, it was recommended to the Institute directors, in the proposed organization of the Institute's marketing division, that a special committee on this subject be provided for. This committee, to include legal counsel, is to be ready to offer its services in connection with discussion and preparation of any oil marketing code.

Types of Papers Given

The conference committee proposed a list of 30 subjects, for papers to be presented at regional and national meetings of the division of marketing of the institute. Included are a wide variety of topics on practical problems in the marketing of various oil products, and on tax and economic matters—such as gasoline grading laws, tank truck design trends, wage-hour laws, the Iowa Plan after three years of operation, by-passing bulk plants, consumption trends, relationship of octane numbers to road performance, and sales research.

General Committee Listed

The membership of the general committee on marketing for 1940, as named by the institute executive committee Jan. 17, in adjoining column.

25 Names to A.P.I. Marketing Group

E. V. Weber, Cincinnati, of Eureka Oil Co., chairman.

W. R. Boyd, Jr., New York, of American Petroleum Institute, vice chairman.

D. V. Stroop, New York, of American Petroleum Institute, secretary.

W. T. Atkins, Kansas City, of Skelly Oil Co.

Amos Bell, Chicago, of Standard Oil Co. (Indiana).

J. W. Carnes, New York, of Sinclair Refining Co.

J. D. Collins, New York, of Tide Water Associated Oil Co.

Ralph K. Davies, San Francisco, of Standard Oil Co. of California.

H. W. Dodge, New York, of The Texas Co.

S. B. Eckert, Philadelphia, of Sun Oil Co.

Walter L. Faust, New York, of Socony-Vacuum Oil Co.

W. H. Ferguson, Denver, of Continental Oil Co., Inc.

H. D. Frueauff, New York, of Cities Service Oil Co.

C. L. Fleming, Findlay, Ohio, of Ohio Oil Co.

M. V. Hartmann, Pittsburgh, of Gulf Oil Corp.

R. T. Haslam, New York, of Standard Oil Co. of New Jersey.

A. M. Hughes, Bartlesville, Okla., of Phillips Petroleum Co.

V. H. Kelly, Los Angeles, of Union Oil Co. of California.

L. T. Kittinger, New York, of Shell Union Oil Corp.

B. L. Majewski, Chicago, of Deep Rock Oil Corp.

T. M. Martin, El Dorado, Ark., of Lion Oil & Refining Co.

Sam Messer, Oil City, Pa., of Quaker State Oil Co.

R. W. McDowell, Tulsa, of Mid-Continent Petroleum Corp.

Charles S. Smith, Cleveland, of National Refining Co.

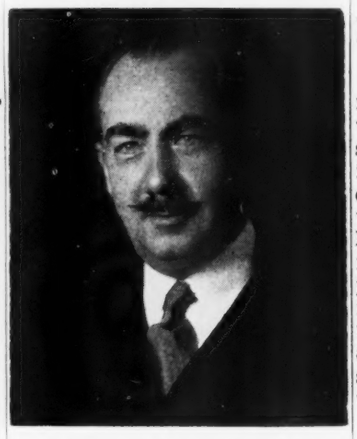
A. A. Stambaugh, Cleveland, of Standard Oil Co. of Ohio.

C. B. Watson, Chicago, of Pure Oil Co.

W. G. Violette, Louisville, of Standard Oil Co. (Kentucky).

W. C. Yeager, Philadelphia, of The Atlantic Refining Co.

Heads Lube Activities



Activities of the A.P.I. lubricating committee, headed by W. H. Correa (Socony-Vacuum), which plans an educational program on crankcase draining, will be tied in with the newly-organized Marketing Division

Cutting Plug Prices Hit by Court Order

TOLEDO, O., Jan. 22.—A permanent injunction against "advertising, offering for sale or selling" Champion spark plugs in California at less than prices established under California fair trade law has been granted a Los Angeles firm, according to report received by the Champion Spark Plug Co. here. This is the second court victory in the company's efforts to enforce a minimum price schedule in states having resale price maintenance laws, it was said.

Dixie Lists Program

MILWAUKEE—National convention of Dixie Distributors, Inc., will be held in conjunction with the annual meeting of the Wisconsin Petroleum Ass'n, Feb. 21, 22 and 23, at Hotel Schroeder, Milwaukee.

Members of the Dixie organization will hold their sessions in the morning, while the Wisconsin association's programs will occupy the afternoons.

Dr. Glenn Frank, economist, former educator, and now editor of "Rural Progress," farm magazine, will speak Feb. 22. Other speakers on program to address Wisconsin and Dixie marketers include A. W. Horton, Oklahoma City, president of Horton Oil Co., Paul E. Hadlick, Washington, secretary of National Oil Marketers Ass'n., Ralph W. Carney, general salesmanager of Coleman Lamp & Stove Co. of Wichita, Kan., George W. Rickeman, chairman of Wisconsin Motor Vehicle Department, and Hoyt Ogram, Kanotex Refining Co.

Strike 'Settlement' At Tulsa Refinery Still is 'Impending'

N. P. N. News Bureau

TULSA, Jan. 22.—Another of the "impending settlements" in the Oil Workers Union (CIO) strike against the Mid-Continent Petroleum Corp. fell by the wayside last week with an accompanying flareup within the CIO and oil workers' union ranks.

Latest settlement plan apparently had reached point where the strikers were to meet and vote on it but the meeting was cancelled after reports that the CIO's regional director for Texas, who has been negotiating for a settlement, might be handled rather roughly if he called for a vote among the strikers on the plan.

Oil Transportation News

Latest developments in freight rates, legislation, regulations, and new construction affecting transportation of petroleum products by truck, barge, tanker, pipeline, and railroad.

Pipeline Sues Rails Charging 'Conspiracy'

(*Continued from page* 9)
reports here, and is checking into the question of Southeastern Pipe Line Co.'s rights of eminent domain (acquiring property by condemnation). He has asked the state's attorney general to determine whether the pipeline company incorporated in the state of Delaware has eminent domain rights in his state.

'Hatched in Washington'

In the anti-trust suit filed by Southeastern Pipe Line Co., rails are charged with plotting and consummating a "conspiracy" in Washington, D. C. Dec. 28, 1939. At that time rails allegedly agreed on plans for preventing construction of the pipeline, which was to transport gasoline in interstate commerce from Port St. Joe, Fla. to Atlanta and Chattanooga, it was said.

Rails were charged with interfering with construction of the pipeline, it was said, by (1) refusing to sell rights of way for the pipeline, (2) harassing pipeline with numerous law suits, (3) influencing private property owners to refuse easements for the pipeline, (4) requesting Florida and Georgia public officials to refuse permits for the pipeline to cross public property and highways, and (5) seeking revocation of permits already granted the pipeline for rights-of-way and easements.

Representative of the suits filed by rails against the pipeline company is the temporary injunction obtained by Atlanta and West Point Railway restraining the Southeastern Pipe Line Co. and its contractors from entering upon rail's rights-of-way for the purpose of laying the line. Suit was filed in Superior Court here. Hearing is set for Jan. 26.

Rails had no announcement late last week as to the progress made on the proposal for reduced rates from southeastern and southwestern origins into the southeast. A scale of "pipeline competitive" rates was worked out earlier this month at an open hearing called by southeastern rails to discuss steps they might take to retain southeastern business. The reduced scale of rates would reduce by about 1.287 cents a gallon the transportation charge on gasoline from certain southwestern refining centers to Atlanta and Chattanooga (See N.P.N., Jan. 17, Page 5).

Rails Urged to Fight Pipelines' 'Unfairness'

N. P. N. News Bureau

WASHINGTON, Jan. 22. — "The pipelines have been built with transportation profits taken away from the railroads by unfair and probably illegal means; for the railroads to longer close their eyes to the matter is slow suicide," Eugene L. Orvis, Jersey City and Washington traffic attorney told executives of all American railroads in an open letter which has been inserted in the Congressional Record by Rep. Coffee, of Washington.

In introducing the letter, the West Coast congressman called the attention of the House to the pending railroad legislation (S. 2009), and commented: "It seems to me that before this Congress enacts any railroad legislation railroad management should itself first take adequate measures to relieve itself of the burdens placed on the railroads by such unfair and illegal practices as are disclosed in this letter."

Mr. Orvis, who testified before the Temporary National Economic (Monopoly) Committee here in October concerning an alleged conspiracy proposal between railroads and major oil companies in the Southeast (NPN, Oct. 18, 1939), and at the same time charged that some tariff practices of pipeline companies were illegal, in his letter to the rail executives reiterated some of his charges, and commented on the testimony of Edwin S. Hall, general counsel for Standard Oil Co. of New Jersey and Harry Klein, counsel for The Texas Co., in their answer to the southeast conspiracy charge. (The oil company lawyers said that when the proposed "deal" with the railroads came to their attention they had immediately pointed out that the plan was of doubtful legality even under the NRA, unless approved by the government.)

Pelley Memo Cited

"That which concerns rail executives at the present writing is the attempt of major oil companies' lawyers at the hearing to shift the blame to the shoulders of the railroads by indicating that the conspiracy originated exclusively in the railroads' headquarters," Mr. Orvis said, adding that "far from being a proposal of the railroads, as oil company counsel insisted, it (the Pelley memorandum introduced by Mr. Orvis at TNEC) was, as the opening paragraph of the letter clearly shows, a confirming memorandum of earlier conferences."

"The intent of these major companies, as disclosed by this memorandum," Mr. Orvis' letter continued, "obviously was (1) to 'pressure' rail rates downward with a promise to distribute only via rail above 50 miles from seaboard; (2) to build higher the rail-freight-rate wall between this southeastern territory and independent oil refiners of the southwest; and (3) to eliminate the filling station business of independents leasing railroad property."

"Rail executives," Mr. Orvis said in the letter, "dealing with a constantly dwindling volume of oil transportation, have sought as best they could to remain independent under steadily applied and ever-increasing major oil company pressure, yet the commerce laws and anti-trust statutes have long been available to curb too-insistent shippers."

Turning to the pipeline angle, the letter said Mr. Orvis "revealed to the (TNEC) committee the methods employed by these common carrier pipelines (mentioning Great Lakes and Phillips by name) for evading the commerce laws and the resultant consequences to the railroads and to independent all-rail oil shippers. This matter has had the careful attention of the Interstate Commerce Commission since I brought the facts to light."

"The ICC," the Orvis letter continued, "manifestly cannot, nor should it be expected to, initiate all necessary corrective steps; I feel the railroads should fight their own battles and most vigorously defend themselves against unfair or illegal practices or common-carrier pipelines, resorting to the law whenever conditions warrant."

Urges 'D. J.' Act

Returning to the Pelley memorandum, Mr. Orvis declared that it "seems inconceivable" that such situations should go unprosecuted by the Department of Justice, and "if and when such prosecution is instituted it seems to me that the arrogance and ruthless power of the integrated oil companies should be mercilessly exposed by you gentlemen."

Resources Board Plans Transportation Study

N. P. N. News Bureau

WASHINGTON, Jan. 22. — National Resources Planning Board, whose appropriation was cut off by the House Appropriations Committee last week because the committee couldn't find a basic law to justify the board's existence, has underway a study of transportation problems generally, it was revealed at the hearings on the Independent Offices Appropriation Bill. Even without an appropriation (which may be restored) the board will continue to function through June 30.

Spokesmen for the Board (successor to the National Resources Committee, headed by Interior Secretary Ickes, which early in 1939 recommended the legislation embodied in the Cole federal oil control bill) told the appropriations committee that "we must have something on pipelines, on aviation, on waterways, on highways (as well as railroads); all put together to see what is the most economical and effective way of moving people and goods from one place to another."

Jersey Builds 5 More Boats, 40 in 4 Years

N. P. N. News Bureau

NEW YORK, Jan. 22.—Contracts for the construction of five new tankers have been placed by Standard Oil Company of New Jersey, an official of the company recently announced. Three of the new oil carriers will be powered with geared turbines and two with Diesel engines. Delivery of the last of these is scheduled early in 1941.

Within the past four years, the company and its affiliates have placed orders for the construction of 40 new tankers, 27 being built in this country, and 13 abroad, at a total cost of $66,884,455.

Outstanding among these construction orders was one placed early in 1938 in agreement with the U. S. Maritime Commission for twelve high-speed National Defense-featured tankers. By the close of 1939, nine of these twelve ships had been launched. Three of them were acquired by the U. S. Navy, two were sold to the Keystone Tankship Corp., two joined the "Esso" fleet, and two more will be delivered shortly. Three still are on the ways, and delivery is scheduled during March, 1941.

The New Jersey Standard's fleet today comprises 205 ocean going tankers having a total deadweight of 2,186,500 tons. Of these, 58 fly the American flag, 39 the flag of Panama, with the rest flying flags of other nations.

Completion of Standard's latest building program will increase their fleet to 218 vessels, having a total of 2,390,200 deadweight tons.

ICC Calendar On Oil Trucking

Hearings

D. H. McCall, St. Elmo, Ill. (MC 84601, Sub. 4) Jan. 26, Springfield, Ill., on common carrier application to transport petroleum products in Ill., Ind., Mo. and Iowa over irregular routes.

Robert F. Toler, Arkansas City, Kans. (MC 66413, Sub. 3) Feb. 2, Wichita, Kans., on application to extend operations as a contract carrier of petroleum and products in Kans. and Mo. over irregular routes.

Pawnee Oil Co., Pawnee City, Nebr. (MC 165, Sub. 2) Feb. 7, Lincoln, Nebr., on application to extend operations as a common carrier of petroleum and products in Kans. and Nebr. over irregular and regular routes.

H. V. Grantham & Sons, Kearney, Nebr. (MC 850, Sub. 3) Feb. 8, Lincoln, Nebr. on application to extend operations as a contract carrier of petroleum and products in Nebr. and Kans. over irregular routes.

Manske Oil Co., Norfolk, Nebr. (MC 920, Sub. 2) Feb. 8, Lincoln, on application to extend operations as a contract carrier of petroleum products in Nebr. and Kans. over regular and irregular routes.

Dugan Oil and Transport Co., Oakdale, Nebr. (MC 22195, Sub. 2) Feb. 9, Lincoln on application to extend operations as a common carrier of petroleum and petroleum products in Nebr. and Kans. over irregular routes.

Tanker Rates Are Unchanged

N. P. N. News Bureau

NEW YORK, Jan. 23—Tanker rates continued to hold steady at all-time record highs reached the closing week of 1939. While reports in the boat market today were that demand for bottoms for early position has eased off somewhat, tonnage was kept busy, resulting in steady rate structures.

Last paid for "clean" boats from the Gulf to North Atlantic were 66 cents per barrel for gasoline, 69 cents for kerosine and 72 cents for light fuel. One boat was available today at one cent higher than last paid shown above, with other owners generally asking up to three cents above these rates.

Last fixture of a vessel for the same movement for light crude or fuel was at 53 cents, with heavy crude at 60 cents. Owners were asking one to three cents higher.

All-Time High Set

Reports were that a fixture at 52 cents on a foreign boat from Venezuela to North Hatteras was recently done. This rate, it was said, represents an all-time high for South American, north Atlantic movement.

Gulf-Italy Fixture Reported

Information regarding boats for foreign movement from the Gulf continued spotty in the boat market. However, one fixture from the Gulf to Trieste, Italy, was reported at $13 a ton. Before the outbreak of war, Trieste generally had a differential of about two to three shillings (50 to 75 cents roughly) over Gulf to U. K. or Continent movement.

Early in January, two fixtures from Curacao to Norway and to Sweden at 41 and 42 kroner, respectively, were reported. This is approximately $9.85 and $10 per ton at present rate of exchange.

Bill Would Set Federal Grades Of Motor Fuel

By Teletype
N. P. N. News Bureau

WASHINGTON, Jan. 23.—Dr. Lyman J. Briggs, director of the National Bureau of Standards, told a House Interstate Commerce sub-committee today that he favored the Boren bill to set up federal "consumer standards"—a bill whose passage could lead to federal gasoline grading, in the opinion of its author and sponsor, Representative Boren, Oklahoma.

Dr. Briggs warned, however, against the set-up becoming "so complex as to lead to unnecessary delay or divided authority."

The bill (HR 6652) would authorize the Secretary of Commerce, through the Bureau of Standards, to establish standards, based on "quality and performance" of all consumer goods except those for which there are already federal standards.

Manufacturers complying with the standards would be authorized to label their goods accordingly. An advisory committee would be set up within the Commerce department to make recommendations as to what classes of goods would have consumer standards established for them, and the bureau would make studies setting up such standards, labeling them A, B and C.

Use of the standards would be voluntary on the part of manufacturers.

Labeling of articles not conforming to standards would be an unfair or deceptive trade practice, subject to Federal Trade Commission action.

Sinclair Posts Long Lake Crude

TULSA, Jan. 22.—Sinclair Prairie Oil Marketing Co., effective at 7 a.m., Jan. 20, made its initial posting of $1.08 a barrel for Long Lake pool crude oil. The field is in Anderson, Freestone and Leon counties of East Texas.

DEATHS

So widespread is the oil industry that many friends are separated for years. NPN would like friends and relatives of any deceased oil man to send in notice of his passing for publication.

Jack H. Hix

Jack H. Hix, aged 48, oil producer living in Oklahoma City and formerly a resident of Tulsa, Okla. died after a heart attack Jan. 16. His wife is the former Sophia Suppes, for several years oil editor for the Tulsa Tribune.

* * *

James A. Hogan

James A. Hogan, aged 64, pioneer independent oil producer, died at his home in Tulsa Jan. 17 following an illness of five months. A native of Titusville, Pa. Mr. Hogan had been a resident of Tulsa for the past 23 years.

* * *

G. E. Johnson

G. E. Johnson, oil producer at Ada, Okla., died at his home following a heart attack Jan. 15. He was organizer of the Fitts Area Producers Assn.

Public Lands Bill Passes

N. P. N. News Bureau

WASHINGTON, Jan. 22. — Senate has passed the bill authorizing those public lands states which do not now include their oil-bearing lands in co-operative or unit agreements to do so (RH 2953). Bill passed the House at the last regular session (NPN, July 12, p. 19). At the time the bill was introduced, it was explained that some states did not feel it within their province to include such lands in unit or co-operative agreements, so Interior Department sponsored the bill which will now become law if signed by the President.

Great Lakes Pipe Line Files New Tariff

N. P. N. News Bureau

WASHINGTON, Jan. 22.—Great Lakes Pipe Line Co. has filed a new tariff covering movement of "gasoline and kerosine" from Oklahoma and Kansas origin to points in Iowa, Nebraska, and South Dakota, via its Omaha terminal. Most of the new rates are increases, a few are decreases. Another tariff covers movements via Des Moines. Exemplary of the new rates are (in cents per gallon):

	From Oklahoma Origins		From Kansas Origins		
Destined for	**New**	**Old**	**New**	**Old**	**Via.**
Audubon, Ia.	1.65	1.58	1.48	1.41	Omaha
Mapleton, Ia.	1.71	1.65	1.55	1.48	Omaha
Wall Lake, Ia.	1.71	1.68	1.55	1.51	Omaha
Elk Point, S. D.	1.78	1.71	1.65	1.58	Omaha
Alta, Ia.	1.51	1.45	1.35	1.28	Des Moines
Chatsworth, Ia.*	1.65	1.71	1.28	1.58	Omaha

* Reduction: Rates are on pipeline transportation to terminals for shipment beyond by rail to destinations named.

OIL TAX NEWS

Louisiana Tax Is Interpreted

BATON ROUGE, La., Jan. 20.—Supreme Court of Louisiana, in a case brought by the state against Sinclair Refining Co., has ruled that the 5-cent state gasoline tax is due on the total amount of gasoline manufactured or imported into the state for sale, use or consumption in Louisiana, less a statutory allowance of 3 per cent for losses in handling.

Sinclair had contended that the tax is due only upon that quantity of gasoline imported into the state that is actually sold, used or consumed, less the 3 per cent allowance.

This decision is a practical reversal of the decision in a case involving Standard of Louisiana, which was thought to have settled the question of how the allowance under the gasoline tax laws was to be interpreted. It had been estimated that the Supreme Court's decision in the Sinclair case will increase the amount of gasoline tax to be paid by the industry by approximately two and one-half per cent.

Application for a rehearing by the Supreme Court will be filed by the company, it was said here.

Restore Import Tax, Wirt Franklin Urges

N. P. N. News Bureau

WASHINGTON, Jan. 22.—Wirt Franklin, Ardmore, Okla., former president of Independent Petroleum Association of America asked the Ways and Means Committee today to "take such action as in your wisdom you may decide to be necessary to restore the situation of the domestic oil industry to that condition which existed prior to the negotiation of the trade pact with Venezuela."

Mr. Franklin appeared before the committee during its consideration of the administration proposal to renew the Reciprocal Trade Agreements Act which expires next June. Under the Venezuela treaty the import excise tax on foreign crude and fuel oil was cut from 21 cents to 10.5 cents per barrel.

Refunds Hold Stage At Denver Meeting

DENVER, Jan. 19. — Gasoline tax refunds, the problem they present to tax administrators, and the inroads they make upon highway funds, highlighted discussions at the two-day meeting of the North American Gasoline Tax Conference here Feb. 15 and 16.

Frank V. Martinek, Chicago, chairman of the Central Tax Evasion Committee warned the conference that the major avenues for evasion are in marine, truck transport and pipeline movement of gasoline (NPN, Jan. 17, p. 15). Eliot H. Evans, general counsel, Central Tax Evasion Committee also addressed the conference.

Representatives of state industry committees, state officials and gasoline tax administrators from 10 states—110 persons in all—attended the conference. Another conference of this group will be held later this year, selection of time and place for second conference has not been decided as yet.

Federal 'Gas' Tax Receipts Rise 7% in 1939

N. P. N. News Bureau

WASHINGTON, Jan. 22.—Federal income from the three direct taxes on the petroleum industry in 1939 totaled $256,024,989, a gain of more than 5 per cent over income from the same sources in 1938, Internal Revenue Bureau reports.

Gasoline tax collections for the year amounted to $215,217,325, more than 7 per cent above the 1938 collections, but a part of this large gain was offset by decreases in revenues from the lubricating oil tax and the tax on pipeline transportation.

Comparative figures on the collections for December and for the entire year follow:

	December 1938	December 1939	% of Change
Gasoline	$16,936,818	$17,000,709	+ 0.3
Lubricating oil	2,109,251	2,306,046	+ 9.3
Pipelines	939,765	769,064	—18.1

	Full Year 1938	Full Year 1939	% of Change
Gasoline	$200,880,797	$215,217,325	+ 7.1
Lubricating Oil	30,495,339	28,836,486	— 2.15
Pipelines	11,599,693	10,971,178	— 5.4
TOTAL	$242,975,829	$256,024,989	5.4

NPN's Log ON OIL LEGISLATION

Oil legislative information, summarized below, is based on reports received at Cleveland from Washington and state capitals which are deemed reliable although NATIONAL PETROLEUM NEWS assumes no responsibility for the accuracy or completeness of this information. For congressional bills, the symbol "S" preceding the number signifies "Senate" Bill; the symbol "HR" signifies "House of Representatives" Bill. For state legislatures, "S" signifies a bill in the senate or upper house; "A" or "H" signifies a bill in the lower house.

Congress

Senate Bills

S-3121 Pepper, Fla.
Prohibiting federal agencies from purchasing articles or materials in a state at a lower rate than that established by the law of such state. Education and Labor Committee.

House Bills

HR-7768 Cannon, Fla.
Providing for issuance of patents by a scientific research division in the Bureau of Standards. Interstate Commerce Committee.

HR 7971 Mundt, S. D.
Providing for strict federal stream pollution control. House Rivers and Harbors Committee.

Hearings

Jan. 31, on S. J. Res. 123, Pittman resolution to embargo war supplies to Japan before Foreign Relations Committee.

Feb. 1, on S 2009, Meeting of conferees on "Omnibus Transportation Bill."

Feb. 5, on HR 7372, Hearings on federal oil control bill before Cole "Oil Subcommittee."

State Legislatures

Bills Introduced

Kentucky

HB-168, Stacy
Constitutional amendment prohibiting gasoline tax diversion.

New Jersey

SB-9, Bowers.
To regulate drilling or digging oil and gas. To Miscellaneous Business Committee.

SB-12, Eastwood.
To fix registration fee for all passenger automobiles at $5. To Highways Committee.

SB-14, Eastwood.
Same as A-32. To reduce drivers license fee from $3 to $1. To Highways Committee.

SB-24, Hendrickson.
To make registration fee for passenger automobiles $10 and fee for driver's license $2. To Highways Committee.

SB-41, Jamieson.
To provide for automobile registration by mail. To Highways Committee.

SB-26, Hendrickson.
To provide for permits for special cases where load limitations is exceeded. To Highways Committee.

New York

A-473, Parsons.
Authorizes cities of more than 30,000 to limit speed of motor vehicles. To Motor Vehicles Committee.

S-259, Esquirol.
Provides for pre-registration inspection of motor vehicles over 5 years old. To Motor Transportation Committee.

S-287, Williamson.
Requires consent of local authorities for operation of omnibus or other motor vehicle line with a first class village. To Judiciary Committee.

S-371, Warner.
Changes motor vehicle registration date to July 1.

A-380.
Registration fee for farm trucks shall be 40c for each 100 lbs. Motor Transportation.

S-130, Hampton.
Same as A-207. Exempts farm machinery from payment of registration fees. To Motor Transportation Committee.

S-203, Young.
Changes basis for state aid to counties and towns for repairs and improvement of town highways. Internal Affairs Committee.

S-205, Stokes.
Same as A-246. Strikes out clause prohibiting imposition of canal tolls. To Judiciary Committee.

A-135, Walters.
Same as S-121. Provides for state acquisition of lands and easements for state highways. Internal Affairs Committee.

Rhode Island

H-588, Windsor.
Amends "fair trade act" to bring gasoline pumps under act; fixes minimum prices. To Judiciary Committee.

H-589, Windsor.
Regulates advertising and sale of gasoline at retail. To Judiciary Committee.

Compactors to Fight Federal Oil Control

(*Continued from page 9*)

ed vice chairman of the compact commission. He was nominated by Hiram Dow of New Mexico, whom he will succeed.

Many observers at the meeting saw, in the naming of Gov. Phillips as chairman, not only the rotation of that post among representatives of the compacting states but also the selection of a powerful leader in the compact's fight against the Cole Bill.

Two pictures of the crude and refined oils stock position were given, one by Dr. A. G. White of the Bureau of Mines and the other by the committee on balance of supply with demand of the Independent Petroleum Ass'n. of America.

Statistically, the two pictures agreed in most of the major details. Dr. White naturally confined his discussion to a factual picture while the I.P.A.A. committee included in its picture specific recommendations.

The one hundred or more oil men "observers" at the meeting paid close attention to Dr. White as he analyzed the past year's production and stocks picture and pointed out the relationship of the past year and particularly the fourth quarter to the outlook in the immediate future.

Dr. White said that the stocks of refinable crude oil in the U. S. currently totaled about 230,000,000 barrels, which is estimated to be very close to minimum working stocks. Thus, the supply and demand can be closely paralleled, but the principal disturbing factor at present is the refined oils stocks situation.

No Overall Surplus

The overall picture, according to Dr. White, does not indicate a surplus of all refined oils stocks although there is at present what appears to be an excess of gasoline stocks, of approximately 10,000,000 barrels. This excess is not so great, he said, when compared with the overall picture and there possibly is some over-emphasis placed on the present situation.

During the past November gasoline yield was at the highest point in history, being 45.8 per cent, while for same reason distillate yield was at the lowest point in many years, being only 13.1 per cent. This meant that gasoline yield was about 1 per cent higher than normal and distillate and fuels yield about 1 per cent lower, with the result that an unbalanced refinery situation developed, particularly in view of the fact that gasoline demand was some 5 to 6 per cent higher than for the corresponding period in 1938 while kerosene, distillate and fuel demand was some 10 to 15 per cent higher.

Readjust Yields

Stressing the point that the bureau made no effort to suggest or recommend to the industry its course, Dr. White made the observation that a readjustment of yields in January and February, to permit greater percentage output of the oils seasonally in heaviest demand, would help to check the trend now apparent which is likely to lead to some 10 to 15 million barrels more of gasoline on hand at the end of the first quarter than many observers believe are sufficient for economic reasons. He also observed that the best time for the industry to rid itself of excess gasoline stocks built up while making the burning oils in demand during the winter months is in the second quarter when pressure for distillates is off but that the industry apparently has a different pattern cut out for itself.

Dr. White said that demand for oils, according to present calculations, will be 6 to 7 per cent above the past year.

A picture of the rapid shifts in demand for crude oil in the various producing states was given by Dr. White in the form of the following table (the figures being in millions of barrels):

State	1937	1939
Texas	502	506
Oklahoma	220	170
California	242	228
Louisiana	90	97
Kansas	70	61
New Mexico	36	38
Illinois	7	89
Michigan	16	23
Pennsylvania	19	18
Wyoming	21	25
Arkansas	13	21

I.P.A.A. Sees Surplus

The I.P.A.A. committee reported that production of crude was in excess of the Bureau of Mines estimate of demand by 98,000 barrels in September; 94,000 barrels in October; 110,000 barrels in November and 218,000 barrels in December. For the year 1939 principal states producing above the bureaus figures were Illinois, California, Michigan, Kansas and Arkansas.

The committee reiterated its statements in its report of December 15th that the statistical position indicates a condition of overproduction in both producing and refining branches of the industry, and once again recommended that crude production for the first quarter of this year be 3,300,000 barrels. Daily, or approximately 390,000 barrels per day under the current rate of production.

Oppose Cole Bill

Members of the compact commission left no doubt, meanwhile, of their stand on the proposed Cole Bill. Gov. Payne Ratner of Kansas, attending his first compact meeting announced that he, Gov. Phillips and Gov. John E. Miles of New Mexico, at a recent conference, drafted a letter that is being sent to the governors of 17 other oil producing states urging them to join these three in Washington to oppose the Cole Bill when the subcommittee opens hearing.

Gov. Phillips stressed the point that opposition to the Cole Bill was not due to partisan lines. He characterized the proposal as an attempt to grab power and said that anyone who is unselfish in his beliefs will recognize the plan an Un-American move.

Texas Governor 'Too Busy'

Jerry Sadler, member of the Texas Railroad Commission, said he wished to apologize for the governor of Texas who has not as yet committed himself on the proposed bill. He said he had told inquirers in Washington that the Texas governor has been busy writing poems and that none of the poems had revealed his attitude on the federal oil measure.

Other representatives who spoke against the Cole Bill, at the open meeting, were Mr. Dow, Lafayette Hughes of Colorado, F. R. Fry of Michigan, and O. C. Bailey, chairman of the Arkansas Conservation Commission.

The executive meeting of the compact this afternoon was devoted almost entirely to a discussion of method of procedure when the commission appears at the Cole subcommittee's oil hearings.

A.I.M.E. Schedules Oil Sessions

N. P. N. News Bureau

NEW YORK, Jan. 20.—The Petroleum Division of the American Institute of Mining and Metallurgical Engineers will hold production technology sessions Feb. 13, production statistical summary with reports on 19 states Feb. 14, and petroleum economics sessions Feb. 15, in connection with the annual meeting of the Institute here Feb. 12 to 15.

Annual dinner of the Petroleum Division will be held in the Biltmore Hotel, Feb. 15.

Shell Rebuilds Plant

TULSA, Jan. 22.—Shell Oil Co. Inc., has begun rebuilding its natural gasoline plant near Healdton, Okla., and will extend its pipeline gathering system in that area. Construction will require about four months.

Gulf Refiners Report Cut in 'Unsold' Motor Fuel Stocks

HOUSTON, Jan. 22.—Members of the Gulf Coast Refiners Ass'n. reported a cut of 210,202 barrels in unsold stocks of motor gasoline in the week ended Jan. 13. Stocks of motor fuel on hand that date stood at 691,235 barrels. Unsold inventory of aviation gasoline increased 38,597 barrels during the week. However, deep drafts were made in stocks of heavy oils.

	Houston District		Corpus Christi Dist.		La. District		TOTAL	
	Jan. 13	Jan. 6	Jan. 13	Jan. 6	Jan. 13	Jan. 6	Jan. 13	Jan. 6
Aviation gasoline	226,937	203,650	296,164	280,864	None	None	523,101	484,514
Motor fuel	156,118	326,447	454,292	495,242	80,825	79,748	691,235	901,437
Naphtha	None	None	187,615	174,050	None	None	187,615	174,050
Kerosine	None	None	None	None	None	None	None	None
Diesel Oil	None	None	None	173,770	None	None	None	173,770
Gas Oil	None	None	34,200	163,370	None	None	34,200	163,370
No. 5 fuel oil	None	None	None	28,900	None	None	None	28,900
Bunker "C" fuel oil	None	None	None	79,850	None	None	None	79,850
Crude runs	213,997	148,610	375,281	291,157	36,650	30,191	625,928	469,958

Octane Rating of Fuels is 'Difficult', S.A.E. Told

Gasolines Vary According to Test Used, Same Model Cars May Differ on Fuels

By N.P.N. Staff Writer

DETROIT, Jan. 19.—Graphical data showing "why it is difficult, if not impossible, by present methods of attack, to assign a definite anti-knock rating to a given fuel which will be valid in different engines under different conditions of operation" were presented by John M. Campbell, General Motors Research Laboratories, at the annual meeting of the Society of Automotive Engineers in Detroit the past week.

Mr. Campbell's paper gave attention to the recent "growing realization that the relative knocking tendencies of different fuels vary with engine conditions." Involved in his findings were the facts that knock is also "largely dependent on the molecular structure of the fuel and that relative knocking tendencies of different hydrocarbons vary over a wide range."

Some pure hydrocarbons in the motor fuel range were tested along with commercial motor fuels in a test engine under four different conditions of engine speed, jacket and air temperatures to determine the permissible compression ratios of the engine as measured by knocking tendencies, i.e., the less the knocking tendency the higher the permissible compression ratio. Some startling differences were noted in the pure hydrocarbons, particularly triptane and di-isobutylene, Mr. Campbell said. While these pure hydrocarbons were much more sensitive to changes in engine conditions than commercial gasoline, the variations in knocking tendencies showed gave striking evidence of the indefiniteness of octane numbers within a range of several numbers.

Campbell said these data indicated that as the present trend toward manufactured fuels of high octane number advances, these problems will become of even greater importance than they are now. However, such data will show how to utilize the individual characteristics of each type of fuel to best advantage and play an increasingly important part in engine design and in fuel manufacture in the near future, Mr. Campbell concluded.

Knock Eludes Octane Scale

The spread in motor fuel octane number requirement of cars of the same model has been so wide that the influence of such variables as spark setting, temperature, carbon accumulation, and engine conditions have been studied especially to analyze the causes for the wide range of values found, it was brought out by J. B. Macauley, Jr., Chrysler Corp.

Mr. Macauley said a renewed attack on the carbon problem—mechanically, through the fuel and oil, and by improved maintenance methods, should be a means of permitting better utilization of octane number than now exists. The octane number requirement of cars was defined as the A.S.T.M. octane number (Motor method) of the blend of two special reference fuels which will permit free acceleration in high gear under the test conditions with only a trace of knock.

Fuel Needs of Same Model Vary

As an example, cars of one model, as tested before adjustment, showed a spread of 30 octane numbers in octane requirement and even after adjustment showed a spread of 16 octane numbers, Mr. Macauley said.

Special attention to the effect of air-fuel ratio on knocking tendency of a motor fuel was given by Harold M. Trimble, who presented extensive graphical data showing how differently various gasolines react to changes in air-fuel ratio adjustment in a motor car.

Correlate Test Methods

A. E. Becker and G. H. B. Davis, Standard Oil Development Co., emphasized the effect of volatility of gasoline on knock ratings and worked out a formula to correlate the Research method of determining octane number to the road rating of a fuel. Their results showed that the road rating of a fuel is equal to the Research rating of either the first 90% of the fuel or the distillate to 300° F., whichever is the larger portion of the fuel.

Clarence S. Bruce, National Bureau of Standards, discussed the changes in octane number requirements of cars with mileage, partially resulting from carbon formations. His results showed that engine operation for 12,500 miles increased the octane number requirement 25 octane units or that the spark setting necessary to maintain a constant octane number requirement of 65 changed nine crankshaft degrees during 12,500 miles operation.

'Aircraft Diesels a Step Behind'

The conclusion of Paul R. Wilkinson, consulting engineer, that the modern aircraft diesel can compete on a parity with gasoline aircraft engines was sharply criticised by several who discussed his paper on "The Performance of Modern Aircraft Diesels" (See Page R-31 of Refining-Technology Edition of N.P.N., Jan. 24, 1940). Arthur Nutt, 1940 president of the S.A.E. and vice president of Wright Aeronautical Corp., attacked Mr. Wilkinson's findings, pointing out a number of "discrepancies" in the latter's figures.

Mr. Nutt's "corrections" dealt particularly with comparative specific weights of aircraft engines and specific fuel consumptions, indicating, in general, that Mr. Winkinson's figures for the diesel were too low and for the gasoline engine too high. Mr. Wilkinson also made several suggestions aimed at hastening aircraft diesel development which Mr. Nutt said had already been put into practice.

Mr. Nutt concluded that aircraft engine manufacturers in the U. S. will be the first to make use of the compression ignition cycle if it proves to be a serious competitor of the gasoline engine. In spite of the fact that Germany lacks proper aviation gasoline and has built aviation diesels of the most modern type, he said German military aircraft are fitted with gasoline engines and will continue so until such time as the diesel engine can measure up to gasoline engine performance.

Others taking sharp issues with Mr. Wilkinson included S. D. Heron, Ethyl Gasoline Corp., G. W. Lewis, National Advisory Committee for Aeronautics, D. P. Barnard, Standard Oil Co. (Indiana), J. B. Fisher, Waukesha Motor Co., and A. L. Beall, Wright Aeronautical Corp.

Price of Fuels is Involved

Mr. Beall said the fuel price and supply question are important in view of the rapidly narrowing spread in brake horsepower specific fuel consumptions between the gasoline aviation engine and the compression ignition aviation engine.

He pointed out that to be useful in aircraft the diesel must be supercharged and such an engine "will not take kindly to a fuel which is a by-product of thermal cracking or one containing measurable amounts of gum, free carbon, filter clay, or water. When the necessity for fuel quality is accepted, and it will be, the supply situation must be recanvassed." Suitable fuel such as water-white kerosine was said to be limited in supply and its market price extremely sensitive to demand.

Lewis said for the NACA that agency's primary interest in the aircraft diesel is for use by the Navy because of the hazard of carrying gasoline on battleships. He said the NACA was neither pro-diesel nor pro-gasoline engine. However, his personal opinion was that the diesel cannot compete with the gasoline engine at present and pointed to a statement by a German engineer that he wished Germany had American gasoline engines to put in their airplanes.

How Safe Are 'Safety Fuels'?

Discussion of aviation safety fuel, about which interest has been revived as the result of newly-assured availability of sufficient of this less-volatile fuel to meet all aviation requirements, brought words of caution regarding the use of the word "safety" in connection with the fuel. Several of those who discussed the subject pointed out that no one knows how safe the so-called safety fuel is. It was, therefore, seriously questioned whether its value from the safety standpoint would be worth the penalty of lost heat content per pound.

Until the past year safety fuel has been of negligible importance in aviation for three principal reasons: Low octane number, limited availability,

and lack of engines designed to burn this type of fuel. While there are still few engines to employ this type of fuel most of the design problems have been overcome. Anti-knock quality is also high enough to be attractive for aircraft.

Resistance to the fuel on any other grounds has been unnecessary. The lower heat value of the fuel was said to be particularly important in long flights of transport planes where a reduction of no more than 1.5 per cent would reduce payload by one passenger.

Discussing the possibility of better evaluation of hypoid lubricants, William S. James Studebaker Corp., said certain tests led him to believe that "possibly the several general types of hypoid lubricants leave their 'finger prints' on heavily-loaded tooth surfaces." If this is true, he believed there might be a way devised to so operate a laboratory test machine as to reproduce these characteristic types of surfaces.

Mr. James concluded that it seemed reasonable that if the conditions of surface temperature, unit load, and sliding velocity were known for hypoid gears, it should be possible to establish a reasonable basis for evaluation of hypoid lubricants.

Reproduction of gear tooth conditions in test machines would be much easier if more complete information were available on actual rubbing surfaces, unit loads, and surface temperatures. He suggested methods of determining these factors similar to those used on spur gears.

S. A. E. Elects Officers

DETROIT, Jan. 19.—Officers of the Society of Automotive Engineers for the coming year include Neil MacCoull, Beacon, N. Y., research engineer, The Texas Co., as vice president representing Fuels and Lubricants Engineering. As such he will act as chairman of this division of S. A. E. activities. Vice chairman of the activity is Earl Bartholomew, Detroit, Ethyl Gasoline Corp. Mr. MacCoull succeeds A. G. Marshall, Martinez, Cal., Shell Oil Co.

G. W. Laurie, Philadelphia, manager of automotive transportation, Atlantic Refining Co., Philadelphia, was elected vice president representing Transportation and Maintenance Engineering.

New president of the society for 1940 is Arthur Nutt, Paterson, N. J., vice president for engineering of Wright Aeronautical Corp., and an outstanding authority on aircraft engine design.

In Next Week's NPN—

Analyses of Some of the New Regular Grade Motor Fuels Introduced this Winter

Results will be published, in the Jan. 31st issue, of a survey made by NATIONAL PETROLEUM NEWS of many gasolines sold this winter by large oil companies. Changes in characteristics of the fuels from a year ago are discussed and shown in tables.

February 'Gas' Demand To be 4% Above 1939

Estimated Daily Average Crude-Oil Demand by States

(Barrels)

State	Forecast February 1940	Forecast January 1940	Actual February 1939
Texas	1,371,400	1,411,000	1,297,000
California	585,900	593,900	572,000
Oklahoma	429,000	433,900	518,000
Illinois	325,500	314,800	142,000
Louisiana	252,800	254,200	237,000
Kansas	155,500	160,600	163,000
New Mexico	100,300	101,900	100,000
Michigan	64,500	61,000	49,000
Arkansas	60,000	59,700	58,000
Wyoming	55,200	58,700	50,000
Pennsylvania	54,900	51,900	46,000
Kentucky	15,200	12,900	13,000
Montana	15,200	15,400	15,000
New York	13,900	13,900	13,000
West Virginia	11,000	10,000	13,000
Ohio	8,700	8,100	4,000
Indiana	5,200	3,900	2,000
Colorado	4,100	3,900	3,000
Mississippi	700	.....	.....
	3,529,000	3,569,700	3,295,000

N. P. N. News Bureau

WASHINGTON, Jan. 22.—Domestic demand for motor fuel in February is forecast by Bureau of Mines at 37,300,000 barrels, 4 per cent higher than actual demand in February a year ago (after adjusting for the extra leap-year day in February this year.)

To meet this demand, Bureau estimates a daily average crude supply of 3,529,000 barrels, about 1 per cent under the estimated January demand, but 7 per cent above actual demand in February 1939.

Although the domestic motor fuel demand figure represents a substantial gain, the Bureau points out that exporters are pessimistic about the export outlook for February, and so the forecast for motor fuel shipments for the month is 2,800,000 barrels, which is 109,000 barrels less than the "relatively low" exports of February 1939.

The Bureau also estimates an addition of about 6,800,000 barrels to finished gasoline stocks during February, bringing them to about 96,000,000 barrels at the end of the month. Finished stocks at the end of February

World Uses 2,000,000,000 Bbls. of Oil in 1939

N. P. N. News Bureau

NEW YORK, Jan. 20.—Preliminary estimates of V. R. Garfias, Cities Service Co., in a paper entitled the "World Petroleum Balance Sheet for 1939", indicate that world civil and U. S. military consumption of petroleum and related fuels in 1939 was 2,000,000,000 barrels, or approximately 92,000,000 barrels greater than 1938.

U. S. civil and military consumption of petroleum and related fuels, including natural gasoline, synthetic oils, shale oil and alcohol was estimated at slightly more than 1,200,000,000 barrels, by Mr. Garfias, with the balance of nearly 800,000,000 barrels for foreign civil consumption.

Despite preparations for war early in 1939, and four months of war at the end of the year, the paper estimates that foreign military consumption and additions to stocks were only 203,000,000 barrels, a gain of 40,000,000 barrels over 1938. He adds, however, that military consumption and additions to stocks are not made public, and part of the increase for military consumption may be accounted for by deficient information regarding production and consumption, particularly in Russia.

Detailed estimates by Mr. Garfias on world petroleum demand are given in the accompanying table.

World Petroleum Balance Sheet

(In Thousands of Barrels)

	World Production of Petroleum and Related Fuels	World Civil and U.S. Military Consumption	Excess Production Over Consumption			United States — Excess Exports Over Imports	United States — To Stocks	Foreign Military Consumption and Additions to Stocks
			United States	Foreign	World Total			
1932	1,362,039	1,348,407	13,001*	26,643	13,632	28,781	41,792*	55,424
1933	1,467,128	1,406,923	67,427	7,222*	60,205	60,254	7,173	53,032
1934	1,562,834	1,507,599	26,164	29,071	55,235	64,013	37,849*	93,084
1935	1,702,793	1,614,475	53,027	35,291	88,318	75,474	22,447*	110,765
1936	1,864,997	1,795,560	52,209	17,228	69,437	74,890	22,685*	92,122
1937	2,121,337	1,914,856	161,445	45,036	206,481	115,677	45,768	160,713
1938	2,062,090	1,907,507	130,770	23,813	154,583	139,000	8,230*	162,813
1939	2,150,000	2,000,000	79,000	71,000	150,000	132,000	53,000*	203,000

* Decrease.

last year were about 89,000,000 barrels.

Addition of the domestic demand estimate, the export forecast, and the estimate of additions to stocks during the months, and subtracting from this total the 900,000 barrels estimated for benzol and direct sales of natural gasoline, gives an estimated refinery production of 46,000,000 barrels for the month.

Gasoline Production Estimated

This is distributed among the various refining districts as follows:

District	Barrels
East Coast	6,020,000
Appalachian	1,920,000
Indiana-Illinois	8,370,000
Oklahoma	2,760,000
Kansas	2,250,000
Inland Texas	3,350,000
Texas Gulf Coast	12,010,000
Louisiana Gulf Coast	1,410,000
Inland Louisiana-Arkansas	790,000
Rocky Mountain	1,210,000
California	6,000,000
TOTAL	46,000,000

'Natural' Ratio is 6.83%

Estimating natural gasolines to be blended at refineries at 6.83 per cent of total production, or 3,140,000 barrels, a total of 42,860,000 barrels of straight-run and cracked production is forecast. Application of the estimated yield of 44.2 per cent to this total gives crude runs of 96,940,000 barrels, or 3,342,700 barrels daily. Foreign Crude runs are estimated as 2,100,000 barrels.

Exports of crude oil are estimated as 5,000,000 barrels, and the estimate for fuel and losses is 2,500,000 barrels, bringing the total estimated demand for domestic crude for the month to 102,340,000 barrels, or 3,529,000 barrels daily.

California Output Cut to 614,701 Bbls.

N. P. N. News Bureau

LOS ANGELES, Jan. 20. — Continued improvement in production curtailment figures were seen today for the month of January, according to oil umpire statistics. Average daily production for the first 17 days in January was 614,701 barrels, as compared with 618,017 barrels for a like period in December.

Average production in California's three main producing areas, for the first 17 days in January, was: San Joaquin Valley, 7669 barrels in excess of its 226,620-barrel quota: Coastal District, 5885 barrels under its 75,611-barrel quota; Los Angeles Basin 17,317 barrels in excess of its 295,153-barrel quota.

Texas to End Oil Shutdowns Except in East Texas Field

N. P. N. News Bureau

TULSA, Jan. 22.—Texas Railroad Commission's allowable crude oil production order for February is expected to permit seven-day production in all fields in the state except the large East Texas field.

This was indicated definitely at the statewide proration hearing in Austin, Tex., on Jan. 18 when the three commissioners said they were in accord on the plan to abolish the "shutdowns" which have been used for several months past in an endeavor to keep Texas crude output within reasonable market demand limits.

The East Texas field will continue to have weekly shutdowns, it was indicated, because of the fact that the Humble Oil & Refining Co.'s federal court suit against the commission's present method of prorating that field is set for trial Feb. 12.

The commission will have to redistribute the allowable throughout almost the entire state, it was said, in order to reinstate seven-day production. Some districts accordingly will receive increases and others will undoubtedly receive reductions from present allowables.

To Drop Special Allowables

The commission also is expected to set the allowable figure on Feb. 1 at the same total as the Bureau of Mines' estimate of market demand for Texas crude that month, and to keep production at that point throughout the month. This would eliminate the many special increases which the commission has granted during the past after the monthly proration orders were issued.

The new order was not expected to be issued, however, until about Jan. 25, after Commissioners E. O. Thompson and Jerry Sadler have returned from the quarterly meeting of the Interstate oil compact commission meeting Jan. 22 at Wichita, Kan.

If the commission returns to the seven-day production method in its February order will mean it is placing a new interpretation on the state's marginal well law. This statute has been a stumbling block of sorts for a long time. The commission in the past has taken the stand that it was prevented by the marginal well statute from reducing the allowable from any well below the minimum specified in that law, which has been computed to be an average of 22 barrels per well per day.

Many oil operators have been arguing with the commission now for some time that the marginal well law applied only to pumping wells which could not make more than the specified maximum per day when produced without any restrictions and that it did not apply to flowing wells nor to pumping wells which could make more than the amount specified in the law.

Backs Marginal Well Law

Request for a new opinion from Attorney General Gerald Mann resulted in a reiteration that the marginal well law is valid, and that the commission cannot cut marginal wells below the minimum set by the law, but that the commission can reduce better wells, either flowing or pumping, below the marginal well law minimums, if such cuts do not reach the point of confiscation. Thus it appears the commission, driven to the move by necessity, is swinging away from its former interpretation of the marginal well law and leaning more nearly to the interpretation oil operators have asked them for some time to adopt.

Debate 20-Acre Spacing

The hearing Jan. 18 was enlivened considerably by the debate between commission members and operators over the 20-acre well spacing rule proposed by Commissioner Sadler. The suggestion met with vigorous opposition in many quarters. Substitute plans were offered and discussed but the commission did not indicate it would make any effort at this time to promulgate a statewide spacing order. Some oil men say the commission does not have any authority, anyway, to take such a step.

Build Recycling Plant

FORT WORTH, Tex., Jan. 22. —Roeser & Pendleton, Inc., has announced plans for construction of a recycling plant in the Cayuga field in southeast Texas. Plant will have a capacity of approximately 10,000,000 cubic feet daily.

The construction of the Tidewater Associated Oil Co.—Seaboard Oil Co. partnership plant in the same field is about half completed. This is the second plant for this partnership, the first one having been constructed about two years ago.

Crude Stocks Drop Slightly

N. P. N. News Bureau

WASHINGTON, Jan. 22. — Domestic and foreign refinable crude oil stocks decreased 332,000 barrels during the week ended Jan. 13, Bureau of Mines reports, totaling 238,249,000 barrels on that date. Stocks by grade or origin are shown in tabular form on Page 24.

December Oil Exports Up

N. P. N. News Bureau

WASHINGTON, Jan. 22. — Preliminary figures of the Commerce Department show that U. S. exports of petroleum and products in December were valued at $35,421,000, compared with $31,260,000 in November, $33,190,000 in December, 1938, and $28,841,000 in December, 1937. Data for exports by countries of destination are not yet available.

Deep Cut Made In Fuel Stocks

N. P. N. News Bureau

NEW YORK, Jan. 23. — Another deep cut in stocks of gas oil and distillate fuel was recorded the week ended Jan. 20, according to report of refinery operations compiled by the American Petroleum Institute today.

Refinery inventory of light fuels was cut 920,000 barrels, with a draft of 518,000 barrels on stocks at terminals and in transfer, making a total cut of 1,438,000 barrels.

Heavy fuels stocks were cut a total of 130,000 barrels during the week. However, a cut of 298,000 barrels in refinery stocks of residual fuels was offset somewhat by an increase of 168,000 barrels in storage of this oil at terminals and in transfer.

Stocks of gasoline at U. S. refineries continued to mount last week, when all districts, with the exception of the East Coast, added to refinery inventory. Total increase for the country as a whole in motor fuel stocks was 1,554,000 barrels. East Coast inventory was down 287,000 barrels. The largest increase took place at Texas Gulf plants, where stocks were up 484,000 barrels. Indiana-Illinois-Kentucky refineries added 394,000 barrels to stocks.

Crude runs to stills were cut 10,000 barrels on daily average during the week, according to the Institute report. Indiana-Illinois-Kentucky refineries cut crude throughput 28,000 barrels on daily average.

Latest Oil Industry Statistics

Trends of Basic Figures

	Jan. 20, 1940	Jan. 13, 1940	Jan. 21, 1939
Crude Production (Bbls. daily)	3,637,450	3,592,200	3,264,450
Crude Imports (Bbls. daily)	85,428	90,857	33,428
Crude Runs to Stills (Bbls. daily)	3,510,000	3,520,000	3,310,000
Gasoline Stocks (Bbls. total)	85,880,000	84,326,000	75,455,000
Gas Oil & Distillate Stocks (Bbls. total)	21,092,000	22,012,000	27,009,000
Residual Fuel Oil Stocks (Bbls. total)	77,915,000	78,213,000	114,082,000

Crude Oil Production for the U. S.

(American Petroleum Institute figures)

	Week Ended Jan. 20 Barrels	Jan. 13 Barrels	Jan. 6 Barrels
Oklahoma	419,900	417,900	435,700
Kansas	176,650	167,500	166,400
Nebraska	100	100	50
Texas	1,357,650	1,350,150	1,346,050
Louisiana	270,750	267,350	269,050
Arkansas	70,700	69,600	69,450
Mississippi	3,200	2,950	2,450
Illinois	366,700	337,400	330,050
Eastern (Ill. excluded)	103,400	101,450	99,400
Michigan	64,600	65,400	68,150
Wyoming	62,050	68,350	64,650
Montana	17,450	17,400	16,950
Colorado	4,100	4,000	4,150
New Mexico	100,000	109,150	109,100
California	620,200	613,500	602,000
Total U. S.	3,637,450	3,592,200	3,584,450
Crude Imports	85,430	90,860	69,430
Total New Supply	3,722,880	3,683,060	3,653,880

Weekly Changes in U. S. Crude Oil Stocks*

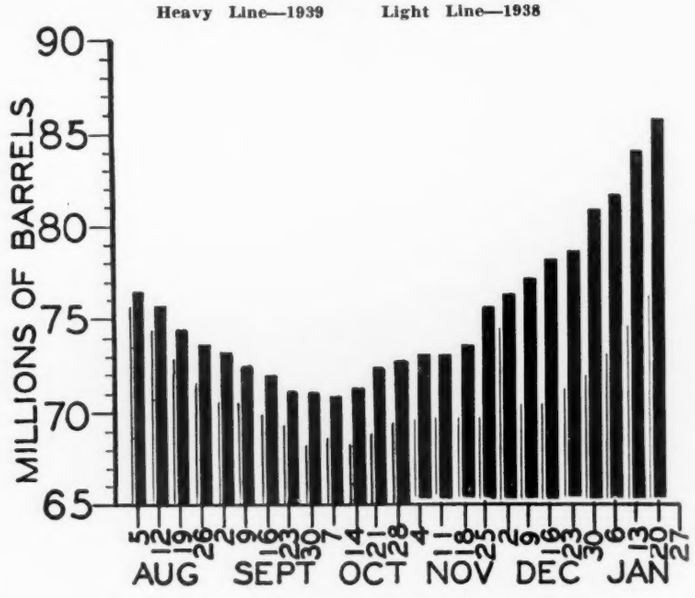
(Thousands of barrels)

Grade or origin	Dec. 30	Jan. 6	Jan. 13	Change from Jan. 6
Pennsylvania Grade	4,688	4,631	4,606	— 25
Other Appalachian	1,436	1,455	1,432	— 23
Lima-Michigan	1,456	1,519	1,506	— 13
Illinois-Indiana	16,592	16,728	16,433	—295
Arkansas	2,683	2,759	2,804	+ 45
Kansas	6,814	7,089	7,163	+ 74
Louisiana:	11,162	10,963	10,980	+ 17
Northern	3,801	3,674	3,677	+ 3
Gulf Coast	7,361	7,289	7,303	+ 14
New Mexico	5,939	5,892	6,112	+220
Oklahoma	60,377	60,218	60,377	+159
Texas:	70,611	71,087	70,696	—391
East Texas	15,741	16,216	15,639	—577
West Texas	15,306	15,506	15,499	— 7
Gulf Coast	18,078	18,133	17,972	—161
Other Texas	21,486	21,232	21,586	+354
Rocky Mountain	17,669	17,794	17,899	+105
California	35,320	35,675	35,695	+ 20
Foreign	2,995	2,771	2,546	—225
Total U. S. refinable	237,742	238,581	238,249	—332
Heavy in California	13,292	13,336	13,336	.....

* As compiled by U. S. Bureau of Mines.

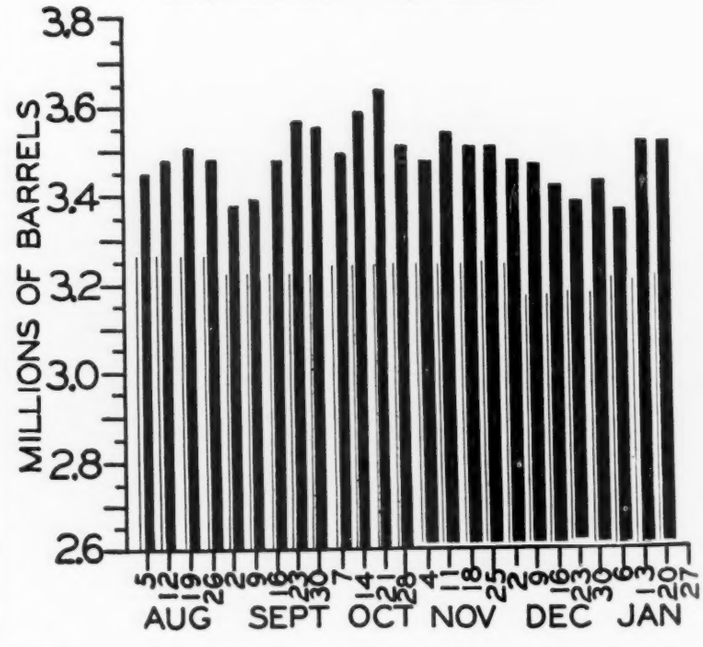
Total U. S. Motor Fuel Stocks

Heavy Line—1939 Light Line—1938



Daily Average Crude Runs to Stills

Heavy Line—1939 Light Line—1938



A. P. I. Weekly Refinery Report

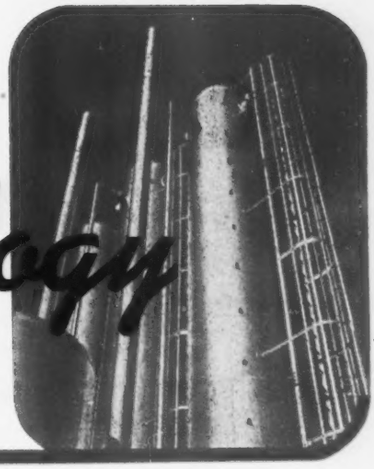
(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Daily Average Crude to Stills Week Ended Jan. 20	Jan. 13	Per Cent of Reporting Capacity Operated Week Ended Jan. 20	Jan. 13	(a) Gasoline Production Week Ended Jan. 20	Jan. 13	Stocks Total Finished & Unfinished Motor Fuel (b) Week Ended Jan. 20	Jan. 13	Stocks of Gas Oil & Distillates At Refineries Week Ended Jan. 20	Jan. 13	At Terms. Trans. Pipelines Week Ended Jan. 20	Jan. 13	Stocks of Residual Fuel Oil At Refineries Week Ended Jan. 20	Jan. 13	At Terms. Trans. Pipelines Week Ended Jan. 20	Jan. 13
East Coast	602	605	97 9	98 4	1,720	1,611	18,628	18,915	3,296	3,509	4,719	4,999	3,836	3,717	3,903	3,829
Appalachian	122	115	84 1	79 3	446	424	3,874	3,680	267	260	141	156	500	480	.....	.....
Ind., Ill., Ky.	489	517	83 6	88 4	1,902	2,050	13,126	12,732	3,071	3,138	559	632	2,670	2,726	10	24
Okla., Kans., Mo.	250	252	73 1	73 7	(c)906	(c)860	7,289	7,139	1,314	1,363	19	21	2,269	2,367	.....	.....
Inland Texas	117	121	73 6	76 1	512	466	1,835	1,754	319	343	.....	.....	1,669	1,734	.....	.....
Texas Gulf	851	849	89 6	89 4	2,555	2,726	13,720	13,236	3,189	3,571	586	704	5,355	5,542	213	189
La., Gulf	121	120	69 1	68 6	289	263	2,631	2,425	893	873	22	22	680	739	215	242
No. La., Ark.	38	44	69 1	80 0	177	110	633	529	232	230	11	11	429	455	.....	.....
Rocky Mt.	56	43	87 5	67 2	224	240	1,333	1,244	159	154	.....	.....	471	438	.....	.....
California	495	485	66 4	65 1	1,236	1,383	16,811	16,782	7,602	7,811	1,739	1,771	57,561	57,915	22,326	22,224
Total Reporting	3,141	3,151	81 9	82 2	9,967	10,133	79,880	78,436	20,342	21,252	7,796	8,314	75,840	76,113	26,667	26,499
U. S. Total (d)	3,510	3,520			11,523	11,714	85,880	84,326	21,092	22,012	7,796	8,314	77,915	78,213	26,667	26,499
U. S. Total 1-20-39 (d)	3,213				10,908		76,452		24,210		9,609		99,399		17,586	

(a) Includes straight-run, cracked and natural blended.
(b) Includes stocks at refineries, in bulk-terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.
(d) Estimated, U. S. Bureau of Mines basis.

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY



Dear Reader:

Youngest of the ten "professional activity" engineering groups of the Society of Automotive Engineers is the Fuels and Lubricants Activity which begins its eighth year this week under the leadership of Neil MacCoull of The Texas Co. Mr. MacCoull's photograph appears on the front cover of this week's issue and an interview with him will be found on page R-.... Vice chairman of the activity for 1940 is Earl Bartholomew of Ethyl Gasoline Corp.

Organization of the Fuels and Lubricants Activity of the S.A.E. in 1933 as a formal division of the society was the result of increasing interest by oil men in fitting their products to the automotive engine and on the part of the automotive engineeers in fitting their engines to existing grades of fuels and lubes. The new activity was approved by the American Petroleum Institute and other oil organizations.

★ ★ ★

1933 should not be thought of as the first year that the S.A.E. sponsored liaison between the oil and automotive engineers. From the founding of the society in 1905 it has served as a clearing house for technical papers dealing with the utilization of petroleum products.

Organization of the Co-operative Fuel Research Steering Committee under the joint sponsorship of the A.P.I., the Automobile Manufacturers Association, the U. S. Bureau of Standards and the S.A.E. was an important earlier step in co-operative effort. The C.F.R. committee has done much in the development of recognized standards for testing fuels through laboratory and road testing.

Work of the C.F.R. resulted in increased membership in the S.A.E. by oil technologists and a larger number of technical papers offered for presentation at national and sectional S.A.E. meetings. When the Fuels and Lubricants Activity was organized in 1933 under the leadership of Chairman A. E. Becker of Standard Oil Development there were several hundred charter members. The membership of the group has grown each year since.

★ ★ ★

The Fuels and Lubricants Activity directly sponsors two or more technical sessions at the S.A.E. annual meeting and at the summer meeting. For several years it has sponsored an autumn meeting in the southwest, usually held at Dallas or Tulsa. In addition it promotes the presentation of papers at section meetings.

A new impetus is expected to be given to participation in technical sessions among oil and automotive engineers through the new Horning Memorial Award. This award, established by Mrs. H. L. Horning in memory of her late husband, takes the form of a cash award and a platinum-iridium medal for the best S.A.E. paper devoted to the adaptation of fuels to internal combustion engines or engines to fuels.

The late Mr. Horning was one of the leaders in the organization of the C.F.R. Committee and in the development of knock testing technique.

★ ★ ★

The diesel engine invasion into the automotive field has been accompanied by a practice that has retarded acceptance of the engine, particularly in bus operation, it was brought out at last week's S.A.E. meeting in Detroit. The smoky exhaust, which is now associated with the diesel engine, is the result of operating diesel engines too close to maximum power output. This is attributed to overzealous selling under competitive conditions.

In contrast, European diesel operations, and particularly the London bus operators, have heard less complaints about smoke and odor since the introduction of diesel equipment than when burning gasoline, it is said, and European diesel engines and fuels are no better than American engines and fuels.

The problem is a co-operative one amongst diesel engine manufacturers, diesel operators, and fuel manufacturers, and, from the above evidence, primarily one of control of engine variables. Fuel research has gone a long way in minimizing this condition through control of two or three diesel fuel properties. In this issue is an account of recent research related to diesel fuel properties and their effect on exhaust smoke by Standard Oil Development Co. engineers.

★ ★ ★

Sales of diesel engines in 1939 totaled 2,144,000 horsepower according to a compilation by *Diesel Power and Diesel Transportation* magazine. This is an increase of more than 500,000 hp. over 1938 and tops the previous peak year of 1937 by more than 100,000 hp.

In 1939 more than 500 new diesel busses were put into commission in the U. S. Previously the total was only about 100. Diesel trucks are not increasing rapidly. The big automotive diesel market still remains in the tractor and road working machinery field. Railroads bought 125,000 hp. of diesels for switching and main line locomotives last year.

Very truly,

J. C. Chatfield

Managing Editor,
Refining Technology Edition.

Availability and Characteristics Of Aviation Safety Fuels†

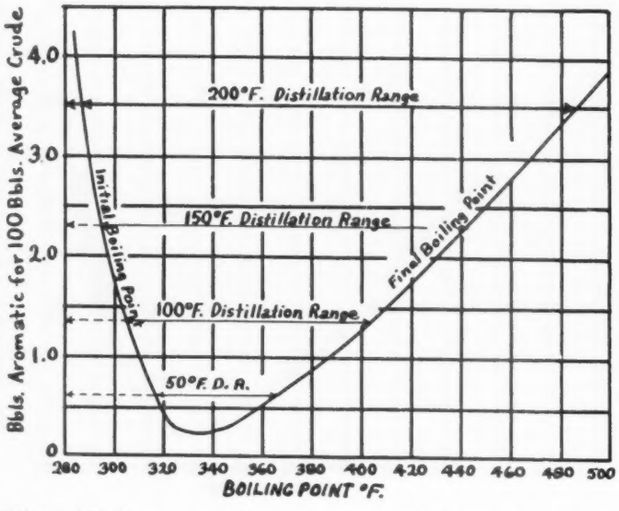
By Robert E. Ellis* and William J. Sweeney*

ABSTRACT

Possibility of reduction of the fire hazard in aircraft has kept interest in safety fuels alive for over a decade. Low octane number of such fuels has prevented serious consideration of their use until recently. Advances in manufacture, utilization, and potential supply of this type of aviation fuel have overcome the obstacles of the past.

Interest in the development of safety fuel for aircraft is greater now than ever before. It now appears that advances in both utilization and manufacture of this type of aviation fuel, coupled with the advantage of reducing fire hazard forecast a potential market of such proportion as to warrant serious consideration of potential supplies.

Safety fuel is a relatively non-volatile gasoline proposed a number of years ago as a means of reducing fire hazard. Its practicability has been seriously handicapped by the low anti-knock values of the high boiling fuels available when the proposal was first made. The U. S. Navy Department has been particularly interested in this development from the safety angle. Although the capacity for producing safety fuel had reached the tank car scale by 1932, interest decreased temporarily because of curtailment of the use of large airships.



Effect of boiling range of crude cut on availability of aromatics of 100° F. flash point for aviation safety fuel

There are two possibilities for safety fuel of high octane number. The aromatic type is immediately available from selected crudes through the application of proven methods of solvent extraction. Supplies of this type material can also be augmented by hydrocarbon conversion processes such as thermal and catalytic reforming dehydrogenation, destructive hydrogenation, catalytic cracking, and vapor phase cracking.

The paraffinic type of suitable octane number for aviation use is not available in any presently known crude oils. Therefore, the paraffinic safety fuels will of necessity be 100% synthetic products, comparable to the blending agents we now use in aviation gasoline: iso-octane, hydrocodimer, alkylate, neohexane, etc.

Properties specified obviously control the availability. In a safety fuel, it must be assumed that the flash point is important and 100° F. minimum has been justifiably chosen as desirable. While flash is primarily dictated by the initial boiling point, the latter can be lowered while maintaining the same flash if the boiling range is increased. An initial boiling point of about 280° F. and upwards, depending on the distillation range, will be necessary to meet a flash point requirement of 100° F. with such a fuel, satisfactory operation requires more efficient handling than in a normally carbureted engine.

Crude cuts of the boiling range of safety fuels are too low in octane number to be used. Although almost 10% of crude is in the 300-400° boiling range, the best octane number in a group of nine representative crudes was found to be 59. This means that these cuts have to be processed with consequent decrease in yield. About 16% of aromatic material can be separated from these cuts by solvent extraction, which is 1.6% of the total crudes. When the economics of separation for all crudes is considered, it is probable that the supply would be cut to 1% or lower. One consideration in the economics of separation is the possibility of improving the paraffinic part of the virgin cut for diesel and burner fuels with a consequent sharing of processing expense. Octane number improvement up to 88-95 clear has been made so far. Lead susceptibility is not particularly good but 100 octane has been reached with 3 cc. of lead.

A maximum of 10,000,000 barrels per year of high octane aromatic material could be made available if equipment were installed. To this may be added the aromatic material produced by the various hydrocarbon conversion processes. Together, these give an availability which can satisfy the aviation industry for many more years of expansion.

These figures are based upon 100° boiling range. The availability is increased markedly by a more liberal speci-

† Condensed from a paper at the annual meeting of the Society of Automotive Engineers, Detroit, Jan. 15-19.

* Standard Oil Development Co.

fication on distillation range as indicated by the following average of three representative crude:

Boiling Range	Relative Availability on Crude
50° F.	0.6
100° F.	1.3
150° F.	2.3
200° F.	3.5

The picture on the availability of paraffinic type safety fuels is not so clear. The synthetic methods referred to above employ refinery olefinic gases and refinery and field isobutane. Indications are that safety fuels will have lower octane number than the blending agents of normal volatility made from the same feed stocks. Nevertheless, these safety fuels can be expected to reach 85-100 octane number, since they will be used as such rather than blended in lower octane number virgin stocks.

These fuels can be made by alkylation or polymerization followed by hydrogenation. In addition feed stock preparation may be resorted to, involving the processes of dehydrogenation, isomerization, or other processes which may be developed.

One of the principal differences between safety fuels of the aromatic and paraffinic type is calorific value. In the extreme, the difference in the net calorific value per pound can be as high as 6-7% in favor of the paraffinic type fuel. On the other hand, the net difference of the calorific value per gallon can be as high as 8-9% in favor of the aromatic type fuel. At present there are differences in opinion as to the relative performance of these two classes of hydrocarbons in full-scale operation. Aviation fuels containing substantial amounts of aromatics have been considered by some to be unacceptable for aircraft engines in the U. S. whereas they have been regarded highly in Europe. Both single cylinder and full-scale engine tests recently carried out here show that partially aromatic fuels give overall performance at least equivalent to the best paraffinic fuels. In view of this, aromatic safety fuels may show the same trend toward better full-scale engine performance.

Since safety is the objective, it is obvious that experimental work must continue on the determination of the properties which contribute to reduction of explosion and fire hazard. One of these properties appears to be auto-ignition temperature, and there is some indication that aromatic type fuels of a given boiling point have a higher ignition temperature than paraffinic fuels.

It is hoped that the industry will be able, through co-ordinated effort, to agree on a general specification which will not include specification items of doubtful value. Recently one general specification has been written which has been generally acceptable to the commercial industry covering five grades of aviation gasolines, differing chiefly in octane value. A similar general specification governs the military services requirement.

Catalytic Cracking is Large Source for Safety Fuels

751.22

An important development in the reconsideration of aviation safety fuels is the introduction of the catalytic cracking method, W. M. Holaday of Socony-Vacuum Oil Co. told the S.A.E. annual meeting. This method will provide for production of the aromatic type safety fuels on a large scale. Over 160,000,000 gallons annually of the base stock for making safety fuel, having an octane number above 85 with the addition of 3 cc. of tetraethyl lead, can be produced using equipment in operation at the present time. Fuel of 100-octane was said to be out of reach of this method. However, 85-octane fuel by the Motor method is rated at 90 octane number by a new supercharged test method.

Generally speaking, the cost of the fuel will be low,

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REFINING TECHNOLOGY

January 24, 1940

Safety fuel for aircraft has made sufficient advances in both utilization and manufacture to bring it into serious consideration again. The potential supply will meet demand for several years to come R-18

Catalytic cracking process makes available more aviation safety fuel than annual domestic consumption of all aviation gasolines, says W. M. Holaday at S.A.E. annual meeting R-19

Alkylation process yields 15% cut in aviation safety fuel boiling range. Alkylation plants can maintain sufficient supply to meet demand for several years, says Dr. Raymond Haskell at S.A.E. annual meeting R-20

An interview with Neil MacCoull of The Texas Co., newly elected vice president of the S.A.E. for Fuels and Lubricant Engineering R-24

Smoky exhaust from automobile diesel engines, while primarily a problem of engine design, condition, and adjustment, is related to fuel properties: chiefly viscosity, volatility, and ignition quality. Standard Oil Development engineers show R-26

Aircraft diesel engines are expected to be competitive with 100-octane gasoline engines. Latest diesels have many advantages over aircraft engines using gasoline R-31

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Holaday said, but will depend upon the crude selected, its processing, and method of distribution. Since the processing of safety fuels is a new venture to the petroleum industry, availability and costs are therefore to be measured by the results of limited experience with safety fuels using present equipment.

At present there are a number of refining methods which produce fuels having distillation characteristics representative of present safety fuel specifications. By distilling from selected crudes, however, it is possible to make a product having an octane number of about 56, which when leaded with 3 cc. of tetraethyl lead will have an octane number of only 70.

Lead response is considered an important factor in producing the aromatic safety fuels. Generally speaking, as the aromatic content increases the clear octane number will increase, but the lead response will diminish, it was pointed out. Safety fuels produced by catalytic cracking and distillation only, without further processing (such as solvent extraction, acid treating, etc.) contain about 30% aromatics.

These fuels have been found to have a calorific value 1.5 to 2% lower than purely paraffinic fuels of 300-400° F. boiling range in spite of the fact that aromatic hydrocarbons have the lowest calorific values of any of the hydrocarbons and paraffins the highest.

TABLE 1

Inspection Tests of a Catalytically-Cracked Safety Fuel

Gravity, °API	35.9
Specific Gravity	0.85
Distillation:	
IBP	330
10%	341
20%	344
30%	346
40%	350
50%	353
60%	356
70%	360
80%	366
90%	376
E. P.	397
Flash (closed cup)	105° F.

CC. $PbEt_4$	Octane Number Motor Method	Army Method
0	76.3	74.8
1.0	81.4	81.7
2.0	83.5	83.8
3.0	84.7	85.2
6.0	86.5	89.3

Heat Content	
B.T.U.'s per pound—higher value (Experimental data)	19,860
Calculated	19,620

TABLE 2

Composition of a Catalytically Cracked Safety Fuel

Hydrocarbon	Per cent
Olefins	4
Aromatics	36
Naphthenes and Paraffines	60

Total Safety Fuel Demand Can be Met by Alkylation

751.22

A "good conservative estimate" of the available safety fuel to be produced by the alkylation process from plants in operation, under construction, and seriously contemplated is 30,000,000 gallons per year, Dr. Raymond Haskell, The Texas Co., told automotive engineers at the S.A.E. annual meeting. This is based upon a 15% yield of the 300-400° F. cut from the raw debutanized alkylate totaling 200,000,000 gallons produced in a 300-day-operating year. How much 300-400° F. can be made depends somewhat on the manner of operation and how much total yield of regular aviation cut can be sacrificed. If a real commercial interest is developed, Dr. Haskell pointed out, there is no doubt that safety fuel can be made directly, and not as a by-product, in much larger quantities.

Dr. Haskell was indefinite about costs except to say that "the price will be within reason, and as soon as some reasonable definite figure of demand over the next five years can be determined, natural competition will bring the price to a level which the aviation industry can well afford to pay."

The alkylated form of safety fuel, which is of isoparaffinic nature, has been run in test engines in comparison to other forms of high octane fuels, using direct cylinder injection and it has been found that there is no difference in power and efficiency between the safety fuel and gasoline. Tests are also in progress using this type of fuel in the full-sized engine simulating airline service. The principal problem is the difficulty of starting in cold weather, Dr. Haskell said. However, he felt that this will be accomplished shortly. Tests are also underway to determine how safe is safety fuel. He said, "We know it has a high spontaneous ignition temperature and a high fire point but do not know the relation of flash point to actual explosive force—if any."

The accompanying table shows the product to be very stable and to have a fairly good lead response for such a high octane base value. It is not as high in octane value as the gasoline alkylate cut which runs up to 94-octane. "There is every possibility of increasing the safety fuel antiknock value as more study is made on how to make these various hydrocarbons combine the way we want them," he said.

Properties of the Safety Fuel Cut from Raw Debutanized Alkylate

Gravity	57	Doctor Test	Negative
Corrosion Cu strip	No	Sulfur	0.005
Corrosion Cu dish	Good	Heat of Reaction	2
Gum Cu dish	3	Bromine	0.9
Gum accelerated	2	Flash point	103

Distillation		Lead Response	
		cc lead	Octane CFRM
I.B.P.	310	0	81.0
10%	327	0.5	86.0
50%	343	1.0	89.0
90%	362	2.0	92.0
E.P.	384	3.0	94.0
Recovery	98%	4.0	95.5
		5.0	96.5

When is Safety Fuel "Safe"?

In the discussion of safety fuel papers it was brought out by D. P. Barnard, Standard Oil Co. (Ind.) that the term safety fuel was unfortunate because it gives undue importance to the fuel. It was said to be too spectacular a term and might result in obscuring or warping judgment in deciding to use the fuel. Others who discussed the three papers also questioned advisability of using the term inasmuch as no one has yet determined just how safe safety fuel really is. Among others who emphasized this point were included A. L. Beall, Wright Aeronautical Corp., R. D. Kelly, United Air Lines, Major J. H. Doolittle, Shell Oil Co., R. C. Alden, Phillips Petroleum Corp., and H. C. Dickinson, National Bureau of Standards.

Major Doolittle pointed out that no one knows just what flash point might be safe. He said that qualitatively safety fuel is safe but quantitatively there is no information. If the 400-500° F. cut could be used for safety fuel, then, he believed, it would really be a safety fuel comparable to the safety of diesel fuel.

Alden likened safety comparisons to differences between

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lump and powdered coal, the difference being in the form. Dickinson questioned that frequency of accidents involving fire were great enough to warrant changing to a less volatile fuel and pointed out that under certain circumstances met in service explosive mixtures of safety fuel could exist in airplane fuel tanks just as they may exist in gasoline tanks at lower temperature.

Dr. Barnard questioned the constituents in the catalytically cracked fuels besides the aromatics. He said the indications from the tabulated heat content of the fuel were that this large fraction was naphthenic, in which case he suggested that before safety fuel can be made satisfactory, some other material must be found on account of octane number requirements.

He pointed out that the economic desire for safety fuel must balance the cost to produce them and that power loss and the value of octane number should not be omitted in the consideration since safety fuel subtracts some power. The comparison is not between paraffinic and aromatic fuels but is between heat content of safety fuel and aviation fuel, he said. In deciding between the two fuels the question should be raised of how much penalty the consumer can afford to accept in octane number.

Barnard concluded that the aromatic type safety fuel "is behind the 8-ball unless better characteristics are produced than they now have."

Beall brought out that calorific value and lead susceptibility should be included in the consideration, that the combustion problem for high-boiling point is important, and that the Btu. per pound is very important with respect to payload. He said even a 1.5% reduction in Btu. per pound of fuel would eliminate one passenger in a large transport plane.

Kelly pointed out that very few accidents of the past could have been avoided by the use of these fuels. However, as long as some are, airlines are interested in improving safety. He also admitted that loss of heat content can be costly as is evident in long flights of transports where a plane may carry a load of 5000 pounds of fuel and 3000 pounds of load. He said that as far as fire safety is concerned, safety fuel would have more value during the servicing of airplanes on the ground where there is the possibility of stray static sparks and occasional danger from smokers.

Since no definite cost figures were given by the speakers, Major Doolittle said airlines had been able to purchase 100-octane safety fuel at 50 cents per gallon and 95-octane fuel at 35 cents which he compared with the prices of regular aviation fuels of the same octane rating at the same stage of development.

Gyro Patent Suit Settled

Litigation over vapor phase cracking patents between Gyro Process Co., Chemical Research Corp., and certain oil companies has been settled. Gyro obtained a more favorable contract with Gasoline Products Co. Gyro and Chemical corporation released all claims to Pure Oil Co. polymerization and other patents on payment of a cash consideration to Gyro.

Three suits were involved in the Circuit Court of Wayne County, (Detroit), Mich. One case was brought to trial and after 100 days of testimony filling about 12,000 pages of record with over 1300 exhibits it was settled before testimony was completed and the case dismissed.

The case tried concerned three patents, the main one being on polymerization. The Gyro company was plaintiff, and defendants were the Pure Oil Co. and The Texas Co.

Another suit, never tried, sought $30,000,000 damages with Chemical Research Corp. as plaintiff and defendants were Pure, Texas, Standard Oil Co. of Indiana, Gulf Refining Co., and Gasoline Products Co. The third suit, never tried, sought an injunction to prevent directors of the Gyro company from meeting and taking corporate action. The plaintiff was Chemical Research, and defendants were Pure, Texas, Indiana Standard, Gulf, and Gasoline Products.

New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, NW, Washington, D. C., from whom copies may be obtained at rate of 25c each. State number of patent and name of inventor when ordering.

December 5, 1939

Process of treating hydrocarbon oils—H. E. Drennan, Whitenburg, Tex., assignor to Phillips Petroleum Co. Filed May 19, 1936. No. 2,181,877.

Polymerization of olefins—Vladimir Ipatieff and Herman Pines, Chicago, assignors to Universal Oil Products Co. Filed Feb. 7, 1938. No. 2,181,942.

Process and apparatus for treating oil—H. C. Eddy, Los Angeles, assignor to Petrolite Corp. Filed Jan. 26, 1937. No. 2,182,145.

Dehydrogenation of organic compounds—H. P. A. Groll, Berkeley, and James Burgin, Oakland, Cal., assignors to Shell Development Co. Filed July 15, 1935. No. 2,182,431.

Process for conversion of hydrocarbon gases and oils and absorption system therefor—G. L. Eaton, Osborne, Pa., assignor to Gulf Oil Corp. Filed Oct. 31, 1938. No. 2,182,536.

Hydrocarbon composition; oil composition containing metallorganic inhibitors, and hydrocarbon composition—Raphael Rosen, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Apr. 7, 1934, Mar. 19, 1935, and Apr. 25, 1939. Nos. 2,181,913, 2,181,914, and 2,181,915.

Sulfurized lubricating oil—M. B. Chittick, Chicago, assignor to Pure Oil Co. Filed Nov. 18, 1931. No. 2,181,964.

Polymerization of olefins—J. A. Anderson, Olympia Fields, Ill., assignor to Standard Oil Co. (Ind.) Filed June 10, 1937. No. 2,182,512.

Alkylation of naphthenes—A. V. Grosse, Chicago, assignor to Universal Oil Products Co. Filed Aug. 9, 1937. No. 2,182,557.

Conversion and coking of hydrocarbons—J. D. Seguy, Chicago, assignor to Universal Oil Products Co. Filed Mar. 22, 1937. No. 2,182,599.

December 12, 1939

Apparatus and process for flashing mineral oils—M. R. Fenske, State College, and W. B. McCluer, Bradford, Pa., assignors to Pennsylvania Petroleum Research Corp. Filed Sept. 13, 1933. No. 2,183,094.

Process for producing hydrocarbons—Wilhelm Michael, Germany, assignor to I. G. Farbenindustrie. Filed Nov. 1, 1937. No. 2,183,145.

Production of valuable hydrocarbons and their derivatives containing oxygen—Wilhelm Michael, Germany, assignor to I. G. Farbenindustrie. Filed May 4, 1938. No. 2,183,146.

Lubricating oil—Joseph Cole, Whiting, Ind., assignor to Sinclair Refining Co. Filed Sept. 23, 1936. No. 2,183,009.

Lubricant—B. H. Lincoln and Alfred Henriksen, Ponca City, Okla., assignors to Lubri-Zol Development Co. Filed Jan. 12, 1938. No. 2,183,294.

December 19, 1939

Method of decolorizing oils—E. W. Rembert, Plainfield, N. J., assignor to Johns-Manville Corp. Filed May 24, 1934. No. 2,183,590.

Process for treatment of hydrocarbons—W. A. Schulze, Bartlesville, Okla., assignor to Phillips Petroleum Co. Filed Oct. 20, 1936. No. 2,183,591.

Process for desulfurizing oil—U. B. Bray, Palos Verdes Estates, Cal., assignor to Union Oil Co. (Cal.) Filed Sept. 28, 1936. No. 2,183,782.

Process of removing acid components from hydrocarbon distillates—D. L. Yabroff, Berkeley, Cal., assignor to Shell Development Co. Filed Feb. 7, 1939. No. 2,183,801.

Process of treating oil—T. F. McCormick, Oakland, and Arthur Lazar, Berkeley, Cal., assignors to Tide Water Associated Oil Co. Filed Dec. 27, 1935. No. 2,183,968.

Treatment of hydrocarbon oils—C. H. Angell, Chicago, assignor to Universal Oil Products Co. Filed May 31, 1938. No. 2,184,069.

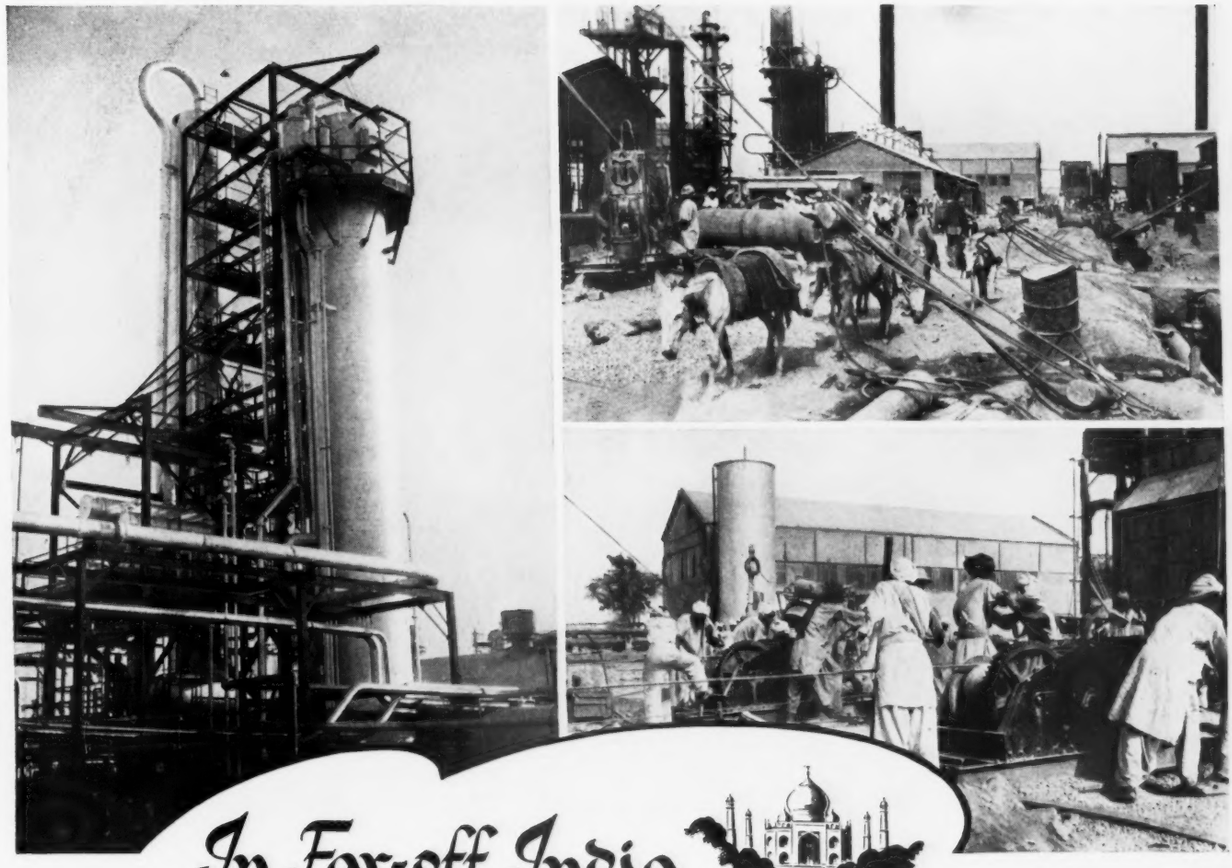
Treatment of hydrocarbon oils and gases—C. G. Gerhold, Chicago, assignor to Universal Oil Products Co. Filed Apr. 23, 1937. No. 2,184,096.

Method of stabilizing volatile liquids—P. D. Barton, Philadelphia, and Karl Fisterbusch, Scarsdale, and N. M. Floyd, Larchmont, N. Y., assignors to American Locomotive Co. Filed Nov. 28, 1934. No. 2,183,604.

Decolorization of still residue—S. G. Burroughs, Pittsburgh, assignor to Pennsylvania Industrial Chemical Corp. Filed Aug. 20, 1938. No. 2,183,830.

Dehydrogenation process—H. P. A. Groll, Berkeley, and James Burgin, Oakland, Cal., assignors to Shell Development Co. Filed Aug. 26, 1935, and Sept. 6, 1937. Nos. 2,184,234 and 2,184,235.

W. K. Mellon, vice president of Petroleum Rectifying Co. of California left Los Angeles this week for the east on company business, his first stop being at the company's branch office in Toledo. From that point he will make a tour of inspection of all Petreco de-salting plants installed at refineries throughout Ohio and Michigan, later continuing eastward to Pittsburgh and New York. On the return trip "W. K." will spend a few days at the company's Gulf Coast headquarters in Houston, returning to his office in Los Angeles early in February.



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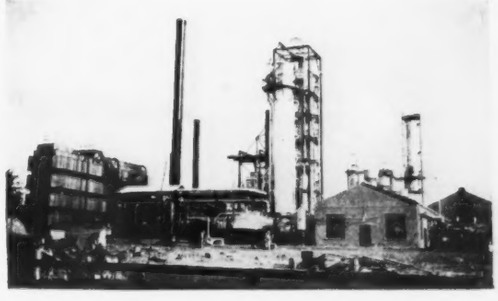

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An Interview . . .

With an Engine Designer Who Became A Fuel and Lubricant Expert

By M. G. Van Voorhis

N.P.N. Staff Writer

● Neil MacCoull of The Texas Co., whose photograph appears on this week's cover, was elected vice president of the Society of Automotive Engineers representing Fuels and Lubricants Engineering at the annual meeting of the society at Detroit. He brings to this position a record of 20 years experience on the technical staff of his company and in committee work of the S.A.E.

Mr. MacCoull entered the employ of The Texas Co. in 1919 on the day after being relieved of active duty with the U. S. Naval Reserve. The S.A.E. helped him get a job as automotive engineer in the sales department. His education and experience had prepared him to be an automotive engine designer but he felt that a temporary position with The Texas Co. would give him valuable training in connection with the engine fuel and lubrication problems which make the difference between success and failure in engines when they are placed in service. His interest in technical problems of fuels and lubricants has grown and the "temporary" employment has extended over 20 years.

In 1919 there were relatively few oil companies with engine test laboratories, and the same was true of The Texas Co. It was not long afterward, however, until the first engine laboratory was organized and a few years later it was moved to Bayonne, N. J. MacCoull was in charge of both these engine laboratories where the performance of fuels in automotive engines, and other mechanical applications was studied. Later, when all research laboratories of The Texas Co. were consolidated at Beacon, N. Y., Mr. MacCoull was again in charge of the mechanical department. He had much to do with the layout of this department of this laboratory. About three years ago he was advanced to staff duties and given the title of Research Engineer.

Much of Mr. MacCoull's work has been a co-operative effort with engineers and executives of many other companies in the development of test methods. The Co-operative Fuel Research (C.F.R.) Committee organized its Detonation Sub-committee to study anti-knock methods early in the twenties and included MacCoull as one of its "charter" members. He has been a member of this committee continuously since then.

As an officer in the Naval Reserve with the rank of Lieutenant Commander and as a motor fuel and lubricant expert, Mr. MacCoull has been associated with the lighter-than-air activities, and has had training trips on the airships Los Angeles, Akron, and Macon. His connection with naval aviation goes back to the World War when he served as a non-commissioned officer for a year and a half, including active duty in France.

Mr. MacCoull was born in Chicago in 1891 but obtained all of his grammar and high schooling in Yonkers, N. Y. Following graduation from Columbia University, with a degree of Mechanical Engineering, he served as draftsman, designer, and later experimental engineer for a small manufacturer of cycle cars. During this time, one of the automobile companies which was pioneering the "high speed" engine, offered prizes for the best article on the advantages of the high speed automobile engine. MacCoull entered this contest and was awarded second cash prize.

This may have been the encouragement which caused him to become technical editor of the *Aerial Age Weekly*. During this period there was considerable discussion as to the most suitable fuel for the use of Rodman Wanamaker's attempted Atlantic crossing in a dirigible. MacCoull's first published article was an attempt to prove the superiority of gasoline over explosives and other extraordinary fuels then under discussion. It was entitled "The Fuel Problem" and was published in the magazine *Flight*. During the period he was with *Aerial Age Weekly* he obtained information necessary for his first S.A.E. paper. Its title was "Airplane Engines" and was published in the S.A.E. Transactions for 1915. This was followed by a paper on the same subject the following year.

Mr. MacCoull's journalistic career was short-lived. It was followed by two years as designer with Westinghouse Machine Co., where his duties covered the details of design of large steam turbines and the original layout of a new type of airplane engine. This was terminated by enlistment in the U. S. Naval Reserve in 1918. He took special training at the Navy School at Columbia University and the Packard Motor Car Co. before being sent across for eight months service in France.

In addition to his work with the S.A.E. committees since joining The Texas Co., Mr. MacCoull was chairman of the Metropolitan New York Section of the S.A.E. from 1925 to 1926. He has been a member of the S.A.E. Research committee from 1927 to date.

One of the interesting phases of his research work was the origination of the chart showing viscosity and temperature characteristics of oils as straight lines. This was published in The Texas Co. house organ, *Lubrication*, in June, 1921. The original chart was laid out on the basis of the log of the logarithm of the kinematic viscosity as ordinate against the logarithm of the absolute temperature as abscissa. Later he improved this by using the log of the logarithm of the kinematic viscosity plus one, and later it was published and widely used with the constant changed to 0.8. This chart, with a minor alteration of the constant, was adopted by the A.S.T.M. and has become their recognized temperature-viscosity chart.

Mr. MacCoull is a member also of the Institution of Automobile Engineers (England) and Associate Fellow of the Institute of Aeronautical Sciences. He is a licensed professional engineer in the states of New York and New Jersey.

From 1917 until 1924 Mr. MacCoull did no writing but in the latter year he again started presenting papers for the S.A.E. which appear in the S.A.E. Transactions of that year. A total of nine S.A.E. papers have been published since 1924, the last being "Power Loss Accompanying Detonation" in the *S.A.E. Journal* for April, 1939. Two papers were prepared for the American Petroleum Institute: one in 1928 and the other in 1936.

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754.2

Exhaust Smoke Control In Automotive Diesels†

By W. W. Manville, G. H. Cloud, A. J. Blackwood and W. J. Sweeney*

ABSTRACT

Unpopularity of using automotive diesels under maximum power aggravates exhaust smoke unnecessarily, as shown by European experience with no better engines, and retards diesel engine acceptance. The tendency to substitute lighter grades of fuel is a poor substitute for proper engine design, condition, or adjustment. While fuel effect is secondary to engine variables in reducing exhaust smoke, the chief fuel properties related to smoking tendency are viscosity, volatility, and ignition quality. The relative importance of these variables is shown by extensive tests with 50 fuels in three engines and tabulated results giving fuel specifications and smoke ratings.

ACCEPTANCE of diesel engines as automotive power units in this country, particularly for bus service, has been retarded by smoky exhausts. This is not an unavoidable condition as shown by the satisfactory performance of European buses in this respect and particularly the London General Omnibus equipment. Their operation shows that smoke control can be effected by other means than resorting to fuels approaching kerosine in volatility.

The explanation lies not in their having better engines than American engines, but rather that they install oversize units such that, for the power required, they can set the smoke stop well down from the critical power point. The solution by means of reducing power is unpopular here because operators feel usually that they must have the maximum power from the engine and/or the diesel equipment salesman is frequently unwilling to recommend oversize engines for fear of losing the sale to a competitive bidder, or agrees to under-powering units rather than oppose the wishes of a prospective customer who wants maximum passenger capacity and low engine cost.

The ultimate solution of the automotive diesel smoke problem rests in mutual recognition by the engine builder, the equipment operator, and the fuel supplier that the problem is one requiring co-operative effort.

In some cases engine design, maintenance or adjustment fail to accomplish the degree of smoke control desired. Under such circumstances improvement can be brought about by the use of lighter fuels of suitable ignition quality. However, this is accompanied by some reduction in power and loss in fuel economy. It would appear more desirable to take the power loss required for smoke control by means of resetting smoke stop adjustment while retaining the advantage from an economy standpoint of the higher Btu. per gallon of the heavier fuel.

Fuel Effect Secondary

This study on smoking has indicated that the effect of fuel characteristics is secondary to engine design, condition and adjustment. This is substantiated by the buses operating in London which develop no objectionable smoke on 55-60 cetane number fuels of 550° F. mid-boiling point.

Insofar as the fuel is concerned, the tendency to smoke in automotive engines has been found to be chiefly related to viscosity, volatility, and ignition quality. The purpose of this paper is to show the relative importance of these variables and their interrelated effects. Approximately 50 fuel blends were tested before the results seemed sufficiently conclusive to establish sound correlations. In this group of fuels were ten competitive branded No. 2 heating oils commonly sold as automotive diesel fuels. The complete results obtained on three laboratory engines are shown in the accompanying table.

The effect of cetane number on smoke is less important than the effect of volatility except in cases where the ignition quality of the fuel is below the minimum demanded by considerations of roughness and cold starting. Fig. 1 shows the relation between per cent smoke in one of the test engines and a series of points on the A.S.T.M. distillation curve of a selected group of fuels of 50+ cetane number. There is a definite relation here between smoke during acceleration after idle and the boiling point of the fuel. Of the various distillation points, the 50% point gives the best correlation for fuels of conventional diesel fuel volatility, particularly where very narrow cut fuels are concerned. The frequently accepted concept that the heavy ends, as measured by the 90% point or some property of the 10% residue, measures smoking tendency, probably owes its origin to the fact that poorly fractionated or contaminated fuels have in the past reached the field.

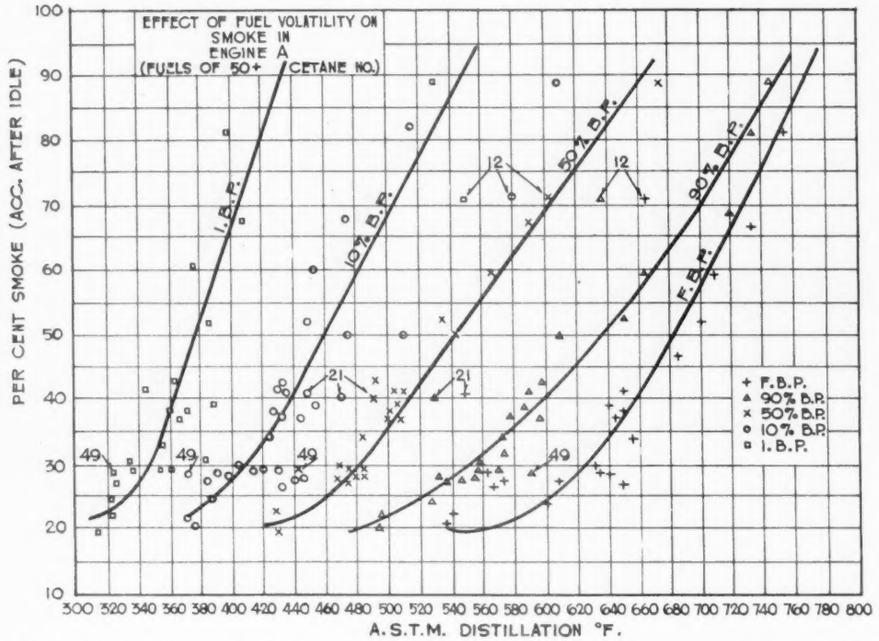

Fig. 1. These curves show a definite relation for one engine between smoke during acceleration after idle and the boiling point of the fuel. The 50% point gives the best correlation for fuels of conventional volatility

As shown in Fig. 2, viscosity is also closely related to smoking for fuels of constant cetane number. However, fuels 24 and 25, which are "poly-butene" blends, give less smoke than would be predicted from their nominal viscosities, indicating that viscosity at 100° F. is not of itself the

†This is a condensation of a paper presented at the annual meeting of the Society of Automotive Engineers, Detroit, Jan. 15-19.

*All of Standard Oil Development Co.

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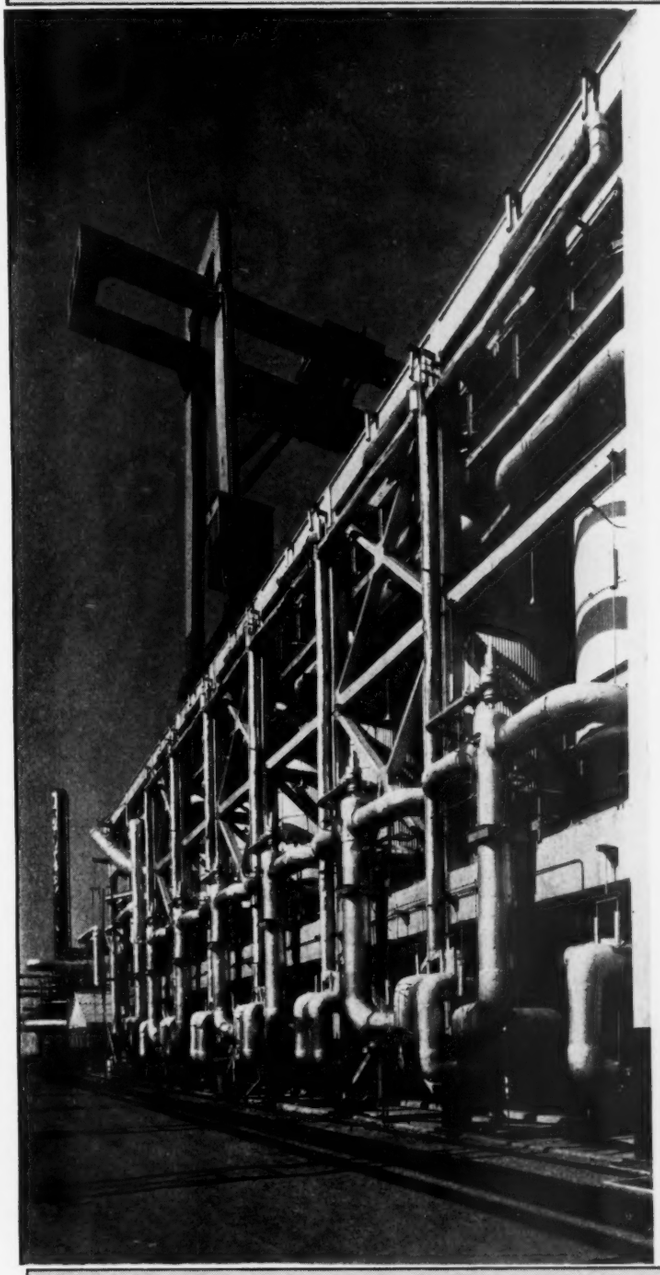

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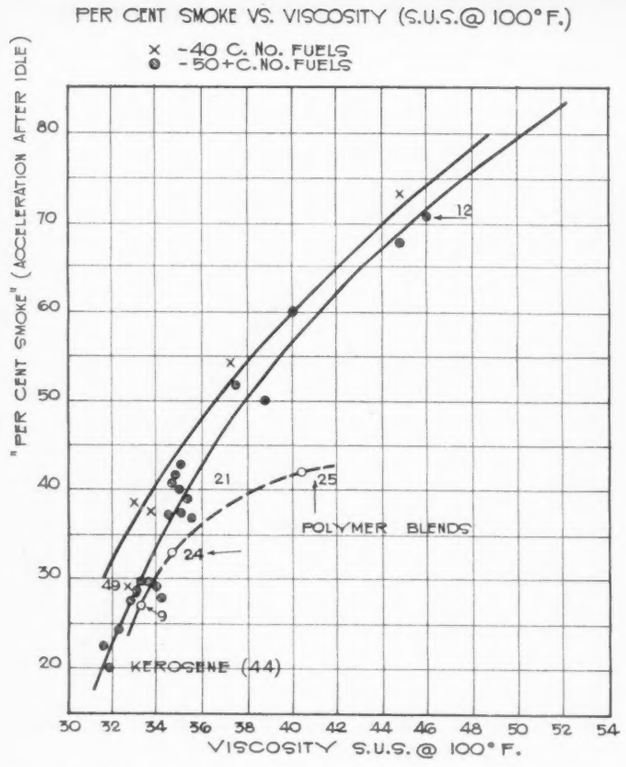


Fig. 2. These curves show the close relation of viscosity to smoking for fuels of constant cetane number. Polymer blends give less smoke than would be predicted from their nominal viscosities, indicating that viscosity at 100° F. is not the only factor in smoke formation

only factor in smoke formation.

Either viscosity or mid-boiling point can be used as a measure of the smoking tendency of normal diesel fuels, because, for conventional fuels of constant cetane number, the two are directly related. However, mid-boiling point has been chosen for making comparisons between fuels because smoke is probably more directly a function of volatility than it is of any other fuel property, provided the engine is not critical to ignition quality. Plotted data of smoke versus 50% point show that for a given 50% point, the smoke intensity increased with a decrease in ignition quality.

Gravity is also related to the smoking tendency of diesel fuels as is shown in Fig. 3. However, such a relation would be expected on the basis of the above data showing the relation between cetane number, mid-boiling point and smoke, because gravity, mid-boiling point and cetane number are interrelated.

In order to obtain the response of the various automotive engine types to changes in fuel characteristics from the standpoint of smoking, a limited series of fuels were run in two test engines in the laboratory and a third in trucking service. The three engines differed considerably in their sensitivity to the variations in fuel quality and it was found that smoking in automotive diesel equipment is particularly sensitive to engine condition. A faulty nozzle can produce dense clouds of smoke on any type of fuel. Cylinder wear increases smoking by permitting the pumping of oil into the combustion space as well as by reducing compression pressure. The following table presenting the smoke produced on reference fuels before and after a long series of tests in which cylinders were scored and rings worn considerably, shows clearly the effect of engine condition.

Fuel	% Smoke New Engine	% Smoke Worn Engine
40	37	57
44	22	38
14	38	67

Reconditioning this engine reduced the smoke values to very near the original figures.

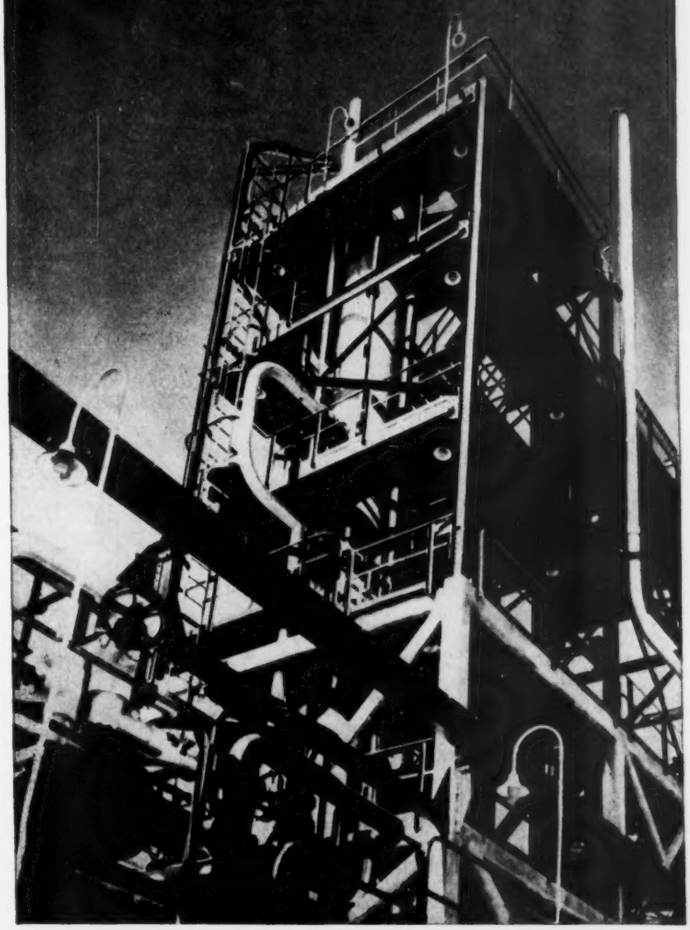
On the basis of test results, it might appear that the way to reduce objectionable smoke in critical engines is to

FUEL INSPECTIONS AND RESULTS OF SMOKE TESTS—ENGINES A, B, AND C

Fuel No.	°API Gravity	Cetane Number	Kin. Vis.	SUS Vis. @ 100°F.	ASTM Distillation, °F. IBP	10%	50%	90%	FBP	Maximum Smoke* During Acceleration A	B	C	Smoke* at Governed Speed After Accel. A	B	C
1	42.2	58	2.25	33.5	390	441	480	532	573	28	22	15.5	17	9	2
2	41.3	58	2.30	34.2	398	442	482	555	650	28	..	17	24	..	10
3	37.4	55	2.70	35.0	370	427	500	596	650	37.5	..	18	30	..	9.5
4	35.7	58	3.45	37.4	387	449	534	650	701	52	36	23.5	38.5	12	13
5	33.7	57	6.10	44.7	410	488	594	720	735	68	51	33.5	48.5	24	12.5
6	33.2	60	7.80	50.8	398	528	640	735	Ck.	81.5	68	40	48	24	14.5
7	33.9	55	4.27	40.0	376	454	568	666	710	60	38	29	47.5	20	8.5
8	38.6	57	2.15	33.2	356	420	476	556	640	29.5	..	..	25.5	..	..
9	45.1	61	2.15	33.2	386	432	474	534	568	27	17.5	12	16	9	3.5
10	36.2	56	3.87	38.8	478	512	542	608	700	50	34	22	34	12	12.5
11	41.5	55	2.40	34.0	358	428	484	569	658	29.5	20	14	36	7	3.5
12	32.0	57	6.36	46.0	550	580	602	638	666	71	58	35.5	49	22	20
13	37.6	57	2.68	35.0	364	434	494	598	686	42	..	17.5	32	..	4
14	33.3	40	2.12	33.1	346	416	472	560	616	38	34	88	31	12	91
15	31.3	41	3.32	37.2	358	432	518	630	693	54	48	96	44	9	93.5
16	27.2	42	5.77	45.0	370	468	566	702	754	73	..	..	67	..	..
17	26.5	40	7.50	50.6	398	484	596	722	760	78	82	98	68	26	96
18	25.6	43	14.24	74.3	412	500	637	720	722	83	..	94	68	..	76
20	29.5	54	15.65	79.7	530	612	680	748	768	89	..	47.5	59	..	18
21	36.6	50	2.54	35.0	450	475	494	528	549	40	..	..	27	..	..
22	43.4	48	1.72	31.7	316	374	429	496	538	20	13.5	..	14.5	5	..
23	38.0	44	1.98	32.6	324	388	450	533	592	23	..	..	17	..	..
24	45.3	57	2.58	34.6	380	432	472	532	560	33	..	..	18	..	..
25	45.3	57	4.35	40.3	382	430	472	528	568	42	..	..	22.5	..	..
26	36.5	50	2.55	35.3	388	454	504	589	640	39	..	..	29	..	..
27	39.2	50	2.15	32.9	336	406	472	557	632	30	..	..	21	..	..
28	40.6	49	2.00	32.6	320	390	454	538	612	26	16	..	20	7	..
29	41.4	48	1.89	32.4	312	384	450	528	594	28	..	..	21	..	..
30	39.4	46	2.07	32.8	318	388	457	542	590	28	25	25	17	8	20
31	38.0	53	2.54	34.5	358	430	502	575	616	37	25	27	28	5	11
32	38.8	55	2.66	34.9	346	432	510	590	650	41	29	16.5	29	11	5
33	34.1	37	2.34	33.8	350	417	475	560	630	37	33	70	29	10	70
34	34.8	44	2.22	33.4	326	424	484	556	606	39	31	..	25	22	..
35	38.3	49	2.45	34.2	348	426	495	586	640	38	25	27.5	18	5	20
36	33.4	45	2.74	35.1	350	425	496	597	656	42	34	..	31	4	..
37	38.3	54	2.68	34.9	374	434	506	594	652	41	26	17.5	29	7	6.5
38	32.3	41	2.75	35.2	358	424	494	614	702	41	35	..	35	5	..
39	37.5	51	2.47	34.3	356	424	484	572	656	34	23.5	..	19	11	..
40	37.5	54	2.8	35.4	368	446	506	518	646	37	..	20	15.5	..	6.5
41	39.5	53	2.24	33.4	338	416	484	559	634	29.5	..	12	..	..	4
42	40.5	51	2.06	32.8	324	398	469	545	608	27.5	..	..	12	..	..
43	41.9	50	1.94	32.3	320	386	452	528	601	24.5	..	..	9	..	..
44	43.4	48	1.73	31.6	320	372	430	496	540	22	..	11	7	..	3
45	41.5	56	2.25	33.5	376	430	478	550	620	..	..	13	..	..	4
46	39.6	52	2.25	33.5	360	425	475	550	623	..	..	13	..	..	5
47	37.8	47	2.26	33.6	368	424	478	560	628	..	..	23.5	..	..	13.5
48	36.1	42	2.27	33.8	362	422	476	556	624	..	..	45.5	..	..	45.5
49	42.4	49	2.08	32.9	322	372	443	590	...	28.0	..	17.0	..	..	..

* Smoke is measured in terms of a photo-electric smoke meter readings on a galvanometer on which zero reading corresponds to complete blackout, rated 100%, and maximum deflection corresponds to clear air and is rated 0%. By comparing visual observations with smokemeter readings, a smoke rating of 35% as determined by the smoke meter, was fixed as the maximum allowable amount of smoke for acceptable operation. This corresponds to a smoke density of 0.19 and to what the average observer might call "light" smoke. The relation between "per cent smoke" and smoke density is not a straight line, 90% corresponds to a smoke density of 1.0, 80% to 0.7, 60% to 0.4, 50% to 0.5, and 20% to 0.1.

Efficiently Utilizing Available Crudes



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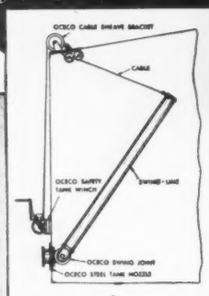

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use light fuels. However, certain practical disadvantages such as loss of power and increased fuel consumption result. The relative economy of a normal high quality automotive diesel fuel and kerosine, and blends of the two, was brought out by tabulating data obtained on a laboratory engine. The figures showed an average of 4% poorer mileage with kerosine as compared to a standard fuel for normal road load operation and 2% poorer for full load operation. This per cent difference in economy approximates the difference in Btu. per gallon, which is 2.4%. The differences in power at full load were greater than the differences in economy. The standard fuel showed 9% more power than kerosine at 2000 rpm. Field tests on fuels similar to the two used in making these comparisons have shown even greater differences in economy in favor of the heavier fuel than was observed in the above-mentioned tests.

These observations suggested the possibility that some appreciable part of the smoke reduction accomplished by a change to a light fuel might be due to lower charge density as expressed in Btu. per pump stroke results. This theory was checked. The results of tests showed that 45% to 70% of the smoke reduction generally attributable to change in fuel, is actually due to the resultant change in power output. Conversely, if the smoke stop on an engine is reset to recover the power lost by changing to a light fuel, approximately the same percentages of the original smoke will reappear.

On the other hand only about a third of the improvement in smoke is due to the fuel itself and if the smoke stop of an engine is set to give satisfactory smoke on the specific fuel to be used, the loss in power output will be small. Conversely, at equivalent power output, there are only small differences in the smoking tendencies of fuels covering a wide range of fuel volatility.

Smoke during acceleration is of greater practical interest than smoke under sustained heavy load and data show that fuel volatility has a somewhat greater effect under these conditions than under sustained load conditions. However, marked improvement in smoke density can be obtained by setting back the smoke stop with some attendant reduction in maximum power.

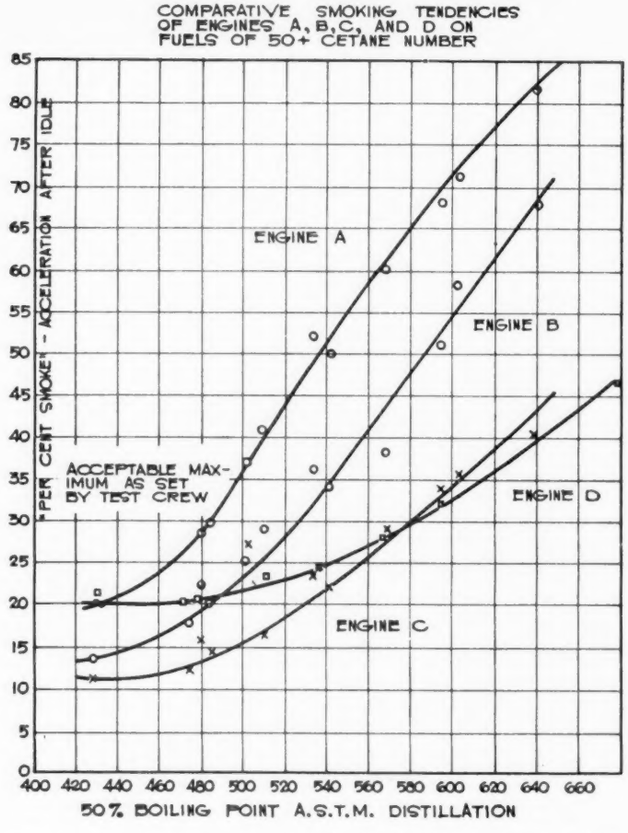

COMPARATIVE SMOKING TENDENCIES OF ENGINES A, B, C, AND D ON FUELS OF 50+ CETANE NUMBER
PER CENT SMOKE - ACCELERATION AFTER IDLE
ENGINE A
ENGINE B
ENGINE C
ENGINE D
ACCEPTABLE MAXIMUM AS SET BY TEST CREW
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85
400 420 440 460 480 500 520 540 560 580 600 620 640 660
50% BOILING POINT A.S.T.M. DISTILLATION

Fig. 3. The effect of changing fuel volatility in four engines shows engine D to be least affected

Aircraft Diesel Development Not Barred by 100-Octane Fuels

ABSTRACT

An up-to-date air-cooled 4-stroke aircraft diesel engine can compete on a basis of parity with an 87-octane gasoline aircraft engine and in all probability with engines operating on 90-octane and 100-octane gasoline in the 1000 hp. to 1200 hp. class.

The aircraft diesel is also at least on a basis of parity with the gasoline aircraft engine in the 1000 hp. water-cooled and liquid-cooled high-performance class. Since the diesel can be conveniently fitted with a turbo-supercharger, there are advantages of proven worth to be derived from the use of a 2-stroke diesel.

ADVANTAGES of the aircraft diesel are still appreciable since the development of 100-octane gasolines and of spark ignition engines to burn these new fuels, it was concluded by Paul H. Wilkinson, consulting engineer, in a paper presented at the annual meeting of the Society of Automotive Engineers in Detroit, Jan. 15-19. These advantages come under two heads, he said. First there are economic advantages such as reduced fire hazard, low fuel operating cost, large payload, and flight range possibilities. Second there are mechanical advantages such as reliability and efficiency.

Wilkinson has had extensive experience in examining both European and American diesel-engined aircraft and in flying in various up-to-date airplanes of this type. He found that the diesel started easily, ran smoothly and accelerated quickly, and did not vibrate or smoke under normal conditions.

Considerable stress was laid upon the importance of the fire hazard. Referring to the frequent claim that most airplane fires originate with the lubricating oil, it was pointed out that oil igniting on the hot exhaust manifold could not ignite diesel fuel as readily as the enormously faster burning gasoline vapor and gasoline.

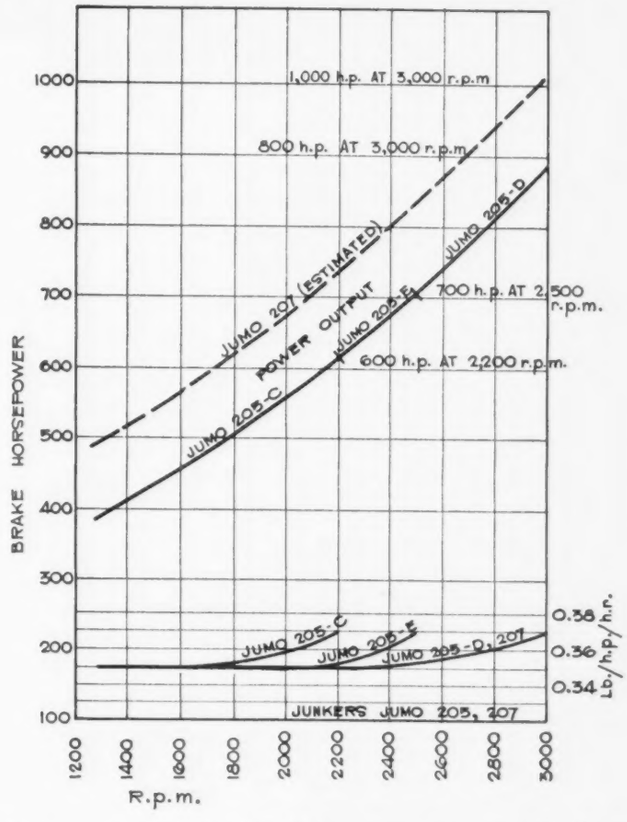
Diesel fuel is of lower specific cost than aviation gasoline and the specific fuel consumption of the diesel is less than that of the gasoline engine, he said. The average saving obtained in the use of 55-cetane diesel fuel is computed at 67.1% over 87-octane gasoline, 68.6% for 90-octane fuel, 77.5% for 95-octane fuel, and 79.7% for 100-octane fuel. Table 4 shows the basis for the computations.

While reliability depends considerably on engine accessories, it is primarily dependent upon the design of the engine, he said. Elimination of electrical ignition devices such as magnetos, spark plugs, and shielded wiring, complicated boost controls, altitude compensating controls, and fuel analyzers go a long way in promoting reliability. Immunity to vapor lock was also mentioned. Early difficulties with fuel injection equipment have given way to trouble-free operation, Wilkinson said. Numerous flights of diesel-engined airplanes across the north and south Atlantic oceans as well as long non-stop flights of landplanes were cited as proof of reliability.

In discussing the tabular comparisons, Wilkinson pointed out that in Table 1 the figures on the Guiberson diesel are based on the assumption that the power output of the present unsupercharged engine can be boosted to 500 hp. by the addition of a gear-driven supercharger which would add 80 pounds to its weight. From the comparison between the N.A.C.A. development and the Wright engine, it is reasonable to conclude that a definite future exists for air-cooled, 4-stroke aircraft diesels in the 400 to 600-hp. class.

The conclusion that the air-cooled 4-stroke aircraft diesel can perform as well as an aircraft gasoline engine using 87-octane fuel and probably with engines using 90 and 100-octane fuel is based on the comparison in Table 2. While the diesel engine used for comparison is still in the theoretical or development stage, it is believed there is no reason why this diesel cannot be built with this performance. The comparison shows also that the diesel is at a slight disadvantage compared with the 87-octane gasoline engine in specific output and at a greater disadvantage in this respect with the 90 and 100-octane gasoline engines as well as being at a slight disadvantage with respect to specific weight. In all instances the diesel has the advantage in specific fuel consumption.

The conclusion that liquid-cooled diesels in the 1000-hp. high-performance class are on at least a parity with similarly rated gasoline engines is based upon the comparison in Table 3. "From this tabulation, it is seen that the diesel is far ahead of the gasoline engines with regard to specific output which undoubtedly is due to its 2-stroke functioning. In the matter of specific weight, at first glance it appears that the diesel is somewhat at a disadvantage. It should be remembered, however, that the diesel requires less cooling area than the gasoline engine on account of its higher



Performance curves for four Junkers diesel engines. The Jumo 207 has the solution of the problem of increased power for take-off. By the use of a turbo-supercharger on an engine equivalent to the Jumo 205, it develops 1000 hp. for take-off

thermal efficiency and so this difference in weight is equalized to a great extent in the engine installation."

In conclusion Wilkinson made several recommendations aimed to hasten the development of the aircraft diesel in the U. S. These included better facilities for exchange of ideas such as authorization of the National Advisory Committee for Aeronautics to gather and publish all the latest data available, release of more data on General Electric's turbo-supercharger, removal of "the veil of secrecy which now envelops aircraft diesel projects in the U. S.", and formation of a separate aircraft diesel activity of the S.A.E. to promote interest and discussion.

Supercharged Diesels

Robert P. Ramsey, The National Supply Co., had something to say in another S.A.E. paper which he hoped would prove the possibilities of supercharging high-speed, four-cycle diesel engines. He said "it seems quite conclusive that the high output, high-speed 4-cycle supercharged diesel engine can be built today on a production basis in very close cost equality with the gasoline engine." The fuel injection apparatus remains the only element of disproportionate cost, he said, and basic simplification is indicated as the correct attack on that problem. He expects to see a single plunger high speed metering pump ultimately placed on the market.

The exhaust gas turbo blower was said to be most attractive for supercharging in theory of driving by exhaust pressure waves but there is a considerable problem regarding cost and durability of the apparatus for automotive high-speed engine application. A supercharger is being put into production by National Supply which is said to be thoroughly reliable, requiring little or no maintenance. The supercharger is also noiseless when properly air silenced it was pointed out. The company's research program is directed toward completely noiseless combustion, better economies and to higher B.m.e.p. output. Ramsey concluded that gasoline and diesel engines can ultimately arrive at the same weight per horse power and cost of production for a commercial engine but when that time arrives the diesel will excell in simplicity and operating economy.

TABLE 1

Comparison Between Medium-Powered Air-Cooled Diesel and Gasoline Aircraft Engines

Type	Guiberson A 1020 (S) Diesel	Pratt & Whitney Wasp S3H1 Gasoline	N.A.C.A. Design* Diesel	Wright Whirlwind R 975 E3 Gasoline
No. of cylinders	9	9	9	9
Total displacement	1020 cu. in.	1344 cu. in.	975 cu. in.	975 cu. in.
Maximum power	500 hp.(E)	600 hp.	500 hp.	450 hp.
R.p.m.	2400 (E)	2200	2250	2250
Specific output	0.49 hp.	0.45 hp.	0.51 hp.	0.47 hp.
Weight of engine	700 lb.(E)	864 lb.	742 lb.(E)	675 lb.
Specific weight	1.40 lb.	1.44 lb.	1.48 lb.	1.50 lb.
Specific consumption	0.38 lb.	0.48 lb.	0.36 lb.	0.46 lb.
B.m.e.p.	162 lb.	162 lb.	180 lb.	165 lb.

E—Estimated figures.
* In the development stage.

TABLE 2

Comparison Between High-Powered Air-Cooled Diesel and Gasoline Aircraft Engines

Engine Type	B.M.W.-Lanova Development Diesel	Pratt & Whitney Twin Wasp SC3-G Gasoline	Wright Cyclone 102A Gasoline	Pratt & Whitney Twin Wasp S1C3-G Gasoline
Fuel rating	55 cetane	87 octane	90 octane	100 octane
No. of cylinders	14	9	14	14
Total displacement	2563 cu. in.	1830 cu. in.	1823 cu. in.	1830 cu. in.
Maximum power	1200 hp.	1050 hp.	1100 hp.	1200 hp.
R.p.m.	2200	2700	2350	2700
Specific output	0.47 hp.	0.57 hp.	0.60 hp.	0.65 hp.
Engine weight	1580 lb.	1420 lb.	1260 lb.	1420 lb.
Specific weight	1.32 lb.	1.35 lb.	1.15 lb.	1.18 lb.
Specific consumption	0.38 lb.	0.48 lb.	0.43 lb.	0.42 lb.
B.m.e.p.	169 lb.	167 lb.	202 lb.	191 lb.

TABLE 3

Comparison Between High-Performance Water-Cooled and Liquid-Cooled Diesel and Gasoline Aircraft Engines

Engine Type	Junkers Juno 207 Diesel	Allison V 1710 C6 Gasoline	Rolls-Royce Merlin X Gasoline	Hispano-Suiza 12-Y Gasoline
Cooling	Water	Prestone	Prestone	Water
No. of cylinders	6 (12)	12	12	12
Total displacement	1014 cu. in.	1710 cu. in.	1647 cu. in.	2197 cu. in.
Maximum power	1000 hp.	1000 hp.	1010 hp.	1200 hp.
R.p.m.	3000 (E)	2600	3000	2600
Specific output	0.99 hp.	0.58 hp.	0.61 hp.	0.55 hp.
Weight of engine	1430 lb.	1280 lb.	1394 lb.	1080 lb.
Specific weight	1.43 lb.	1.28 lb.	1.38 lb.	0.90 lb.
Specific consumption (rated)	0.38 lb.	0.58 lb.	0.66 lb.	0.55 lb.
Specific consumption (cruising)	0.35 lb.	0.46 lb.(E)	0.53 lb.(E)	0.44 lb.(E)
B.m.e.p.	131 lb.	177 lb.	161 lb.	167 lb.

E—Estimated figures.

TABLE 4

Comparison Between the Specific Fuel Operating Costs of a Diesel Aircraft Engine and a Gasoline Aircraft Engine Based on Specific Fuel Costs and Specific Fuel Consumptions in Civil Aviation

	Diesel Fuel	Aviation Gasoline			
	55 cetane	87 octane	90 octane	95 octane	100 octane
Weight of fuel per gal.	7.16 lb.	6.02 lb.	6.02 lb.	6.02 lb.	6.02 lb.
Fuel cost per gal.	5.5c	11.0c	12.0c	18.0c	20.0c
Specific fuel cost per lb.	0.77c	1.83c	1.99c	2.99c	3.32c
Specific fuel consumption	0.35 lb.	0.45 lb.	0.43 lb.	0.40 lb.	0.40 lb.
Specific fuel cost	0.27c	0.82c	0.86c	1.20c	1.33c
Saving with diesel fuel	....	67.1%	68.6%	77.5%	79.7%

Diesel Fuel Viscosity Is Equipment Problem

There are several phases to the problem of diesel fuel viscosity, it was brought out by G. W. Baierlein, American Bosch Corp., in a paper presented at the annual meeting of the Society of Automotive Engineers at Detroit, Jan. 15-19. The high-speed diesel generally uses a viscosity range of 30 to 65 Saybolt Universal seconds. However, if trouble-free operation is assured by certain viscosities, limits are set frequently to a narrower viscosity range.

Baierlein pointed out that it is important to know to what extent viscosity of the fuel oil may affect the various components of the injection system. He summed up the effect upon the fuel oil supply pump volumetric efficiency as negligible even with viscosities as high as 350 seconds if suction tubing and pump are suitably chosen.

A strong effect of viscosity on all types of filters was said to be noticeable. A viscosity of 200 to 350 seconds is considered the upper-limit if an ample flow capacity and adequate filtering efficiency are obtained. The effect of the viscosity of the fuel on the filter may be reduced by increasing the supply pressure, by enlarging the filtering surface, by preheating the fuel, or by employing an additional filtering system such as a centrifuge.

The increased supply pressure is of disadvantage because filtering efficiency is reduced thereby. Preheating is limited since some fuels precipitate and clog the filter. Enlarging the filtering surface was said to be preferable where possible although centrifuging is advantageous for ridding the fuel of water and sediments, grit and other coarse matter.

The effect of viscosity on the fuel delivery characteristic of the injection pump was also said to be insignificant. The duration of injection is affected very little except at higher operating speeds where the duration of injection decreases with increasing viscosity. The higher the viscosity, the poorer is the atomization and the larger the fuel droplets. Large fuel droplets offer less total resistance to the combustion air than finely atomized fuel fog. Since the total kinetic energy of the fuel spray is the same for fine or poor atomization, fine atomization, such as obtained at low viscosity, results in a spray not penetrating as far into the combustion air as poorer or coarser atomization, such as prevails at higher viscosities.

Home, Peace-Time Markets At New High Levels in '40

WAR news may stay in the headlines, but the oil companies' opportunities for increased business this year will come through the growth of consumption in many already established markets in this country.

Not only motor fuel, but most other oil products as well, will reach new high records for domestic demand in 1940. Total domestic demand for principal products—motor fuel, kerosine, gas oil and distillates, residual fuel oils and lubricants—is estimated at around 1,163,000,000 bbls., a gain of a little over 6% from 1939.

Military preparedness programs in this country will contribute only a small portion of this total. War orders at industrial plants here will add some to demand, but the principal growth in consumption will come from the steadily increasing use here of motor cars and trucks, tractors on farms, oil burners, diesel power plants, which, as in past years, has brought about the expansion of the oil industry's markets. Our oil export trade for 1940 is estimated at not much over that in 1938, before the European war started.

While demand in this country for principal oil products leveled off in 1938 from 1937, or even showed small declines, demand in 1939 resumed the steady growth of previous years and many authorities estimate that about the same rate of increase will continue through 1940.

The following estimates of increased demand in 1940 are the average of estimates given to NATIONAL PETROLEUM NEWS by various authorities in the oil industry, and with government agencies, among others:

MOTOR FUEL DEMAND UP 4.6%—Estimate for 1940 is 577,000,000 bbls., 25,000,000 bbls. more than in 1939 and the biggest gasoline market the oil industry has ever had; 29,330,000 motor vehicles to be in operation in 1940.

HEATING OIL DEMAND 9% MORE—Gas oil and distillate domestic demand is estimated at 145,000,000 bbls., 70% of which is from oil burners. Consumption in this market has doubled in five years, 1,860,000 oil burners being in operation here this winter. Sales in 1939 were 225,000 burners.

HEAVY FUELS INCREASE 8.5%—Domestic demand for 1940 placed at 353,000,000 bbls., a gain of nearly 28,000,000 bbls. Increase to come from manufacturing industries and increased use by U. S. Navy.

LUBRICANT DEMAND IS UP—Heavy buying of lubricating oils in the summer of 1939, when prices advanced rapidly, stocked up many firms with a supply they will use in 1940. Even so, domestic demand on the oil companies this year is placed at 24,200,000 bbls., highest on record. Motor oil demand will be 3.6% above 1939.

SMALL GAIN IN EXPORTS in 1940 is seen, even with increased war activity in Europe. Several reasons given why war demand on our oil supplies has been less than anticipated. Total exports for 1940 estimated between 205,000,000 and 210,000,000 bbls.

TEN % MORE TOURING is seen for 1940. Estimate of travel bureau authorities is 50,000,000 tourists, in 13,500,000 cars, with two World Fairs as their destination.

MORE TRACTORS ON FARMS will mean a market about 5% larger than in 1939 for tractor fuels of all types. Estimate of consumption on farms of fuels for tractors, trucks and motor cars in 1940 is 125,000,000 bbls. New low-price, automotive-type tractors will bring big increase in motor fuel consumption on farms, authorities say.

Motor Fuel Demand to Increase 4.6%

The oil companies will have a market in this country for the vast volume of 577,000,000 bbls. of motor fuel in 1940, an increase of 25,000,000 bbls., or 4.6%, from the estimated demand of 552,000,000 bbls.

This is the biggest market for its principal product the oil industry has ever had. It is half as big again as domestic motor fuel demand in 1929.

This estimate of 1940 motor fuel demand is the average of estimates submitted to NATIONAL PETROLEUM NEWS separately by oil industry and other authorities. Individual estimates varied from 574,000,000 to 580,000,000 bbls.

The figures of these authorities also included estimates of actual domestic motor fuel demand for all of 1939. These show that actual demand in 1939 was even larger than had been anticipated at the start of the year, making a better springboard for the oil companies to take off from, in going after new goals for 1940. A year ago, the average of estimates for domestic motor fuel demand given NATIONAL PETROLEUM NEWS was 537,000,000 bbls. It is now estimated that 1939 actual demand was 550,000,000 to 552,000,000 bbls.

Since about 89 per cent of all motor fuel sold in this country is consumed in motor vehicles, the 1940 consumption in motor vehicles can be estimated as 514,000,000 bbls. This is a gain of 4.8% from estimated 1939 actual consumption and indicates a little higher rate of consumption in cars than in 1939. Actual consumption for the first nine months of 1939, as indicated from the gasoline tax reports, was 403,000,000 bbls.

Actual consumption in 1939 of motor

fuel by motor vehicles was placed at about 490,000,000 bbls. by Fred Van Covern of New York, director of the statistical division of the American Petroleum Institute. This was on the basis of an average of 731 gals. consumption by the 28,143,000 motor vehicles in operation throughout the year, and was an increase of 3.8% in consumption per vehicle compared with 1938. The greater use of trucks and buses in recent years, except in 1938, has steadily increased the average annual consumption per motor vehicle. This trend is expected to continue in 1940. The figures of the institute of average annual consumption per vehicle are as follows:

Year	Gals.
1925	502
1929	619
1935	677
1937	721
1938	706
1939 (est.)	731

Production of passenger cars, trucks and buses in the U. S. and Canada of about 4,000,000 units in 1940 is probable, said Mr. Van Covern. This would be an increase of about 15% over the production of automotive vehicles in 1939. If this production level is reached and if scrapping of older vehicles continues at the present rate, an average of 29,330,000 motor vehicles will be in operation in 1940. This is 4.2% more than in 1939.

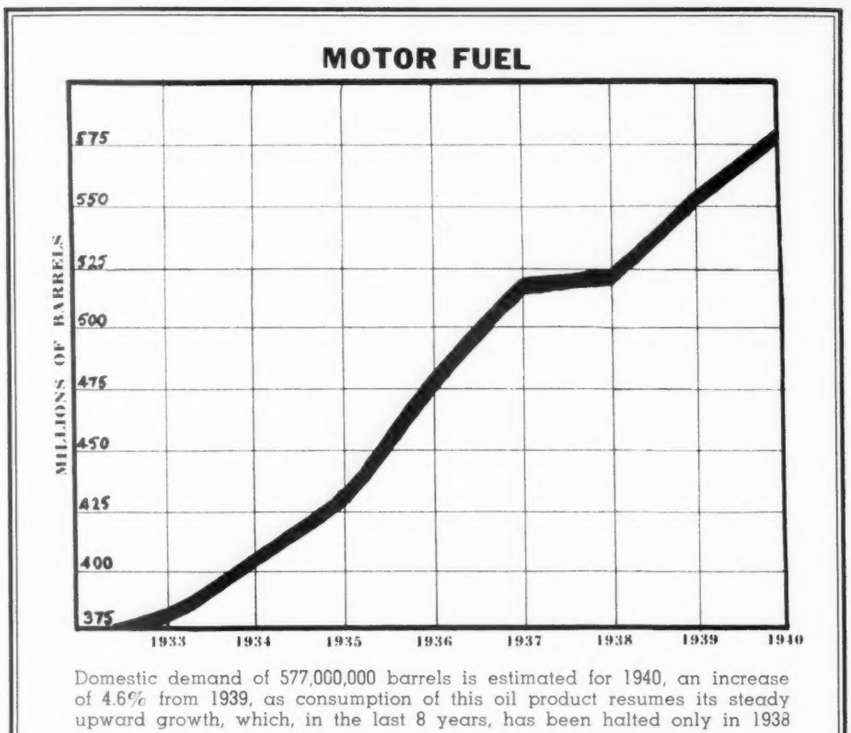
Another recognized authority in the oil industry forecasts an increase in the domestic demand for motor fuel in 1940 of 5.3%, or a volume of 28,700,000 bbls. He makes up this estimate as follows:

Annual increase of 1,060,000 motor vehicles in 1940, with an annual consumption of 685 gals., making a total of 17,300,000 barrels.

Greater use of automobiles will account for 3,700,000 bbls.

An increase in industrial consumption of motor fuel in this country will add 5,800,000 bbls.

Increase in airplane consumption resulting from greater military activity and increased operations by commercial air lines will add 900,000 barrels.



Domestic demand of 577,000,000 barrels is estimated for 1940, an increase of 4.6% from 1939, as consumption of this oil product resumes its steady upward growth, which, in the last 8 years, has been halted only in 1938

Heating Oil Demand Up 9% in 1940

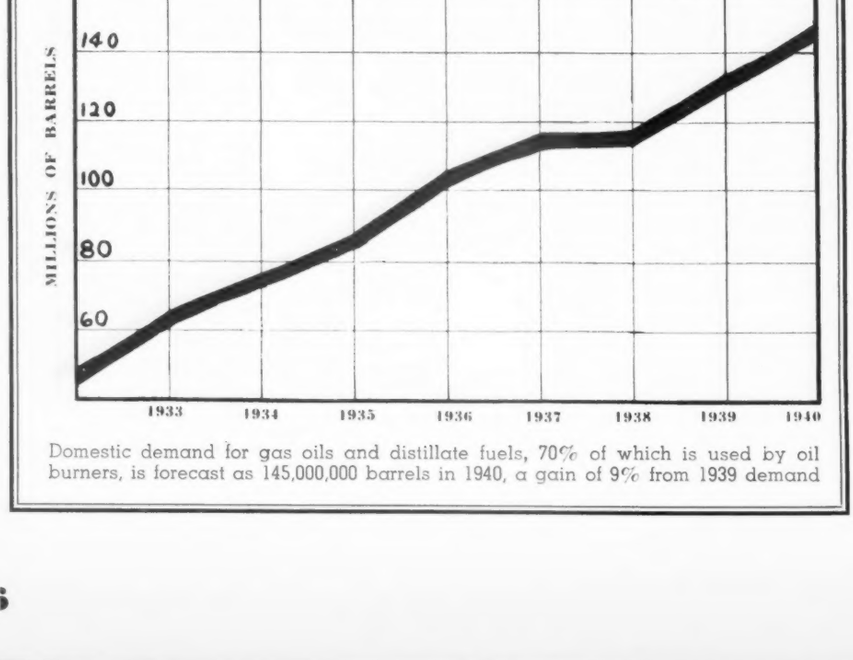
Demand for gas oil and distillate fuels in the U. S. in 1940 will continue to increase, authorities tell NPN. Demand for these oils has doubled in the last five years, about 70% of which comes from domestic oil burners.

Domestic demand for 1940 is forecast as 145,000,000 bbls., an increase of nearly 9% from estimated demand in 1939 of 133,775,000 bbls. While there was but a small gain in total demand for this product in 1938 over 1937, there was a 12% gain from 1938 to 1939.

One authority who predicted a gain of 8.4% in gas oil and distillate demand in 1940 says the increased consumption will come from the use of approximately 234,000 additional burners to be installed during 1940 and from the greater use of burners installed in 1939. Domestic sales of oil burners in 1939 were 225,000, the Oil Burner Institute reports, as compared with 160,000 in 1938.

The American Petroleum Institute statistical department says light oils will have to be furnished this winter to an estimated 1,860,000 domestic oil burners in use, which is an increase of 12% from the number of burners in use a year ago. The 1,860,000 burners in use at the end of 1939 will require more than 90,000,000 bbls. of fuel oil annually, the burner institute reports.

Winters of the last few years have



Domestic demand for gas oils and distillate fuels, 70% of which is used by oil burners, is forecast as 145,000,000 barrels in 1940, a gain of 9% from 1939 demand

not had as low temperatures as are normal, so, if colder weather does prevail in early 1940, consumption of heating oils will be larger than is now estimated, the American Petroleum Institute believes. Estimates by the institute of the number of domestic oil burners in operation by years and total domestic demand for gas oil and distillate fuels is given as follows, by the institute statistical department:

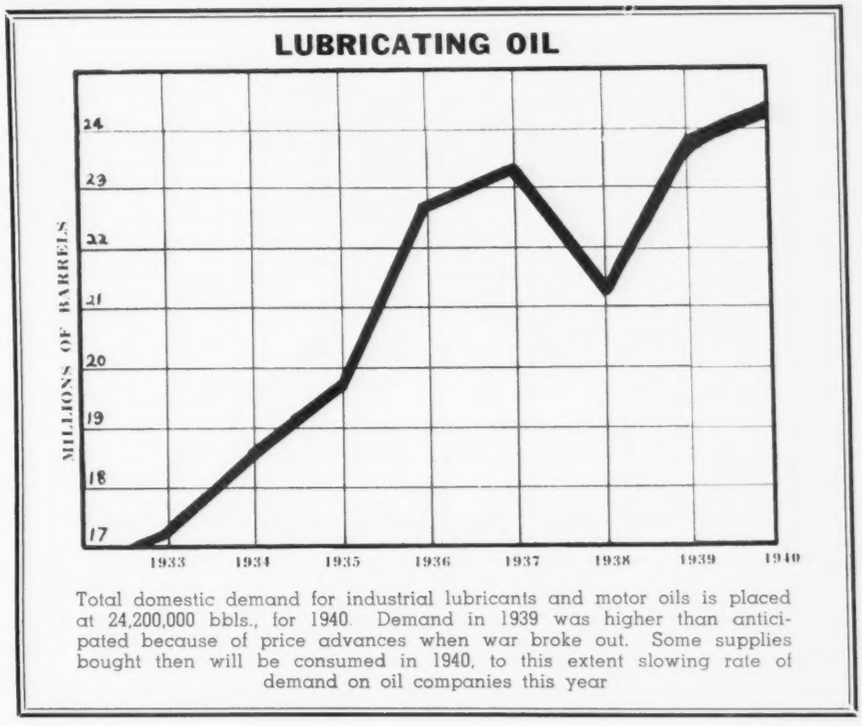
Year	Gas Oil, Distillate Fuel Oil Demand Bbls.	Number of Oil Burners in Operation
1933	64,748,000	913,200
1934	74,824,000	1,014,100
1935	86,018,000	1,155,000
1936	102,757,000	1,355,800
1937	116,841,000	1,553,800
1938	117,449,000	1,657,900
1939 (est)...	133,775,000	1,860,000

Residual Fuel Demand to Increase 8.5%

Domestic demand in 1940 for residual fuel oils is placed at around 353,000,000 bbls., through an average of estimates given NPN by various authorities. This is nearly 8.5% larger than estimated domestic demand of 325,400,000 barrels in 1939.

One authority, who forecasts the increase in demand for the heavy fuel oils at 26,000,000 barrels, says this increase will come largely through larger consumption by the U. S. Navy and manufacturing industries. Another authority says there will be a larger demand for this product in California particularly, than in 1939.

Residual fuel oil was the only petroleum product for which 1939 domestic demand was not above the level reached in 1937. Demand in 1939 was slightly less, but 1940 demand, as most conservatively estimated, will be a new high.



Total domestic demand for industrial lubricants and motor oils is placed at 24,200,000 bbls., for 1940. Demand in 1939 was higher than anticipated because of price advances when war broke out. Some supplies bought then will be consumed in 1940, to this extent slowing rate of demand on oil companies this year

Larger "Lube" Demand in 1940 Even with Heavy Buying in '39

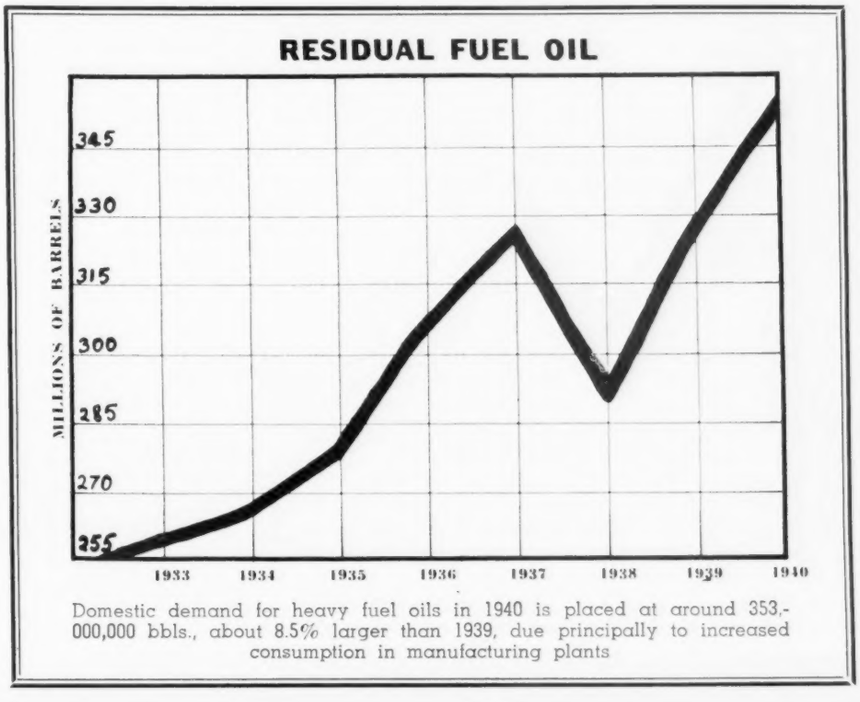
Domestic demand for lubricating oils in 1939 was higher than had been estimated. Part of this was occasioned by the rapid price advance when war broke out and is in inventories held by industrial concerns which will be applied to consumption early in 1940.

One oil authority places total domestic demand in 1939 for lubricating oils at 23,905,000 bbls., of which 12,735,000 bbls. was motor oil and 11,170,000 bbls. industrial lubricating oil demand. This same authority at the start of the year estimated total 1939 demand at around 23,000,000 bbls., of which 12,500,000 bbls. was motor oil and 10,500,000 industrial lubricants.

Because of this demand on the oil companies for lubricants in 1939 in excess of actual consumption, a small increase in demand is anticipated in 1940, which, however, will be less than actual consumption. Total demand for all lubricating oils in 1940 is estimated at 24,200,000 bbls., an increase of only a little over 1% from 1939 demand as now estimated. This is the first time in the history of the oil industry though that it has had a lubricating oil market in sight of over 24,000,000 bbls.

Of this total estimated 1940 domestic demand, motor oil demand is placed at 13,200,000 bbls., which is an increase of 3.6% from 1939. Demand for industrial lubricating oils in 1940 is estimated at 11,000,000 bbls., which is actually less than present anticipated 1939 demand of 11,170,000 bbls. This 1939 demand, however, is 670,000 bbls. larger than had been anticipated at the start of the year and a large part of this is thought to represent additions to consumers' stocks, which will be used in 1940.

Another authority places the 1940



Domestic demand for heavy fuel oils in 1940 is placed at around 353,000,000 bbls., about 8.5% larger than 1939, due principally to increased consumption in manufacturing plants

domestic demand for lubricants at about 25,000,000 bbls. and estimates 1939 demand at 24,000,000 bbls., an increase of a little over 4%.

Federal agencies estimated domestic lubricating oil consumption for the Treasury Department on which it estimates its receipts from the tax on all lubricating oils of 4 cents a gallon. These agencies placed the increase in domestic demand for the year starting July 1, 1940, at 11% over the current fiscal year ending June 30, 1940.

The Treasury Department estimated its receipts from the lubricating oil tax for the next fiscal year at $36,300,000, which would be on the basis of 21,607,000 bbls. taxed. Receipts for the current fiscal year are estimated at $32,700,000, which would be on the basis of 19,465,000 bbls. taxed.

Domestic Demand for Motor Oil, Industrial Lubricating Oil and Total Domestic Lubricating Oil Demand, 1925-1938

(Figures in 000 Barrels)

Year	Estimated Gasoline to Motor Oil Ratio*	Motor Oil Demand	Industrial Lubricating Oil Demand	All Lubricating Oil Demand
1925	25.24	9,221	11,360	20,581
1926	27.24	10,111	12,457	22,568
1927	29.24	10,443	11,226	21,669
1928	31.23	10,851	12,317	23,168
1929	33.22	11,526	12,083	23,609
1930	35.22	11,294	10,295	21,589
1931	36.20	11,266	8,658	19,924
1932	37.60	10,048	6,566	16,614
1933	39.00	9.756	7,396	17,152
1934	40.10	10,233	8,251	18,484
1935	40.10	10,843	8,818	19,661
1936	41.00	11,746	10,930	22,676
1937	41.00	12,653	10,721	23,374
1938	42.50	12,276	8,971	21,247
1939**	43.20	12,735	11,170	23,905
1940**	43.80	13,200	11,000	24,200

**Estimated.
*One gallon of oil to indicated number of gallons of gasoline.

Exports of Crude and Refined Products From U. S. for 11 Months of 1938-39

(Data from Bureau of Mines and Dept. of Commerce

	1938 (000 barrels)	1939 (000 barrels)
Motor fuel	44,686	41,423
Aviation gasoline		3,862*
Kerosine	6,701	7,591
Gas oil and distillate	27,228	30.023
Residual fuel oil	16,183	16,170
Lubricants	8,741	10,671
Total refined products	105,237	108,352
Crude	72,371	67,417

*Included in the 41,423,000 barrels of motor fuel.

Oil Exports and U. S. War Demand

As regards our oil export trade in 1940, the only point on which various authorities agree is that the volume to be expected is uncertain and depends on several factors in the progress of the European war, the principal one being the degree of intensity in warfare which may develop.

Exports of crude and refined products in 1939 are now estimated at about 191,000,000 bbls., which is nearly 3,000,000 bbls. under 1938 exports. The only products to show increases in 1939 were Diesel-type fuels and some miscellaneous products. Various reasons are given why the volume of exports of petroleum and products since the outbreak of war have not been as large as anticipated. Among these reasons are:

That tanker rates have increased 200 per cent since the outbreak of war and there has been delay on the part of England and France in organizing their convoys to protect tankers in crossing the sea.

That the Allies are taking their supplies as far as posisble from their own properties in Asia and South America and thus conserving their resources to buy in this country supplies, such as airplanes, which cannot be secured elsewhere.

That the trade of the central European countries has been lost to this country since the war started, because of the British blockade.

That normal consumption in France and England and neutral European nations is cut down through rationing of supplies and that large stocks had been accumulated in anticipation of the outbreak of war.

That the "cash and carry" policy of the U. S. in trading with warring nations limited their buying here.

Acknowledgment

For their aid in preparing forecasts of 1940 demand for petroleum products published in this issue, NATIONAL PETROLEUM NEWS expresses its thanks to Fred Van Covern, director of the Department of Statistics, American Petroleum Institute, New York; U. S. Bureau of Mines of Domestic Commerce, Washington; John D. Gill, Philadelphia, Atlantic Refining Co., J. J. Frey, Ethyl Gasoline Corp.; Joe H. Thompson, director Conoco Travel Bureau, Denver, among others.

That the unusual nature of the war so far has caused a smaller actual consumption by military operations than had been anticipated.

One authority believes the volume of 1940 oil exports will be between 205,000,000 and 210,000,000 bbls. and that a larger proportion of the foreign trade than in 1939 will be in fuel oils, lubricants and aviation gasoline. Any war development which closes the Mediterranean, from which England and France are now receiving large supplies of oil, will increase the demand on this country.

U. S. War Demand

Popular assumptions about the wartime petroleum requirements of this country are greatly exaggerated, it was brought out by J. Howard Pew, of Philadelphia, president of the Sun Oil Co., in a recent statement.

Testimony of War and Navy Department officials was to the effect that the Navy now uses about 9,000,000 bbls. of fuel oil a year, while the Army uses about 1,250,000 bbls. of all oil products, said Mr. Pew, and in the event of war, requirements of the Navy might rise to 50,000,000 bbls. and of the Army to 10,000,000 or 12,000,000 bbls. "Three days of present national production would supply peace-time requirements for a year; two weeks production would meet a year's war-time requirements as estimated," he stated.

Mr. Pew concluded that war demand would bring no critical nor difficult situation for the oil companies in this country in furnishing adequate supplies, no matter what the call might be. He pointed out that we have far greater supplies to call on than in the last war, that our proven reserves underground are large, that production outside this country has increased greatly since the last war and that the development of refining processes in this country now makes it possible to secure a far larger proportionate yield of gasoline from crude oil than 25 years ago.

A winning story

Up against it in 1934, a certain Mid-Continent refiner put in a Dubbscracking unit, charging 1200 barrels a day of crude oil It solved the problem, and in 1935 he said:

> "Based on a 60 percent yield this cracking operation gives the company 25 to 50 cents per barrel increased return on finished products"

So in 1937 he went to Dubbs 2-coil operation — increasing daily charging capacity to 3400 barrels And still he needed more gasoline

In 1938, he installed the U.O.P. catalytic poly process to make more anti-knock gasoline from cracked gas

Today he is charging 3600 barrels of crude a day to his Dubbs unit and here is what he gets:

	Percent
Gasoline	65.17
Polymer gasoline	2.20
500 endpoint gas oil	.35
Residuum	25.79
Gas and loss	6.49
Octane rating of gasoline (L 3 Method)	71.2
Octane rating of polymer gasoline (L 3 Method)	84

No wonder this refiner says today:

> "I do not believe anyone has a plant operating to better advantage"

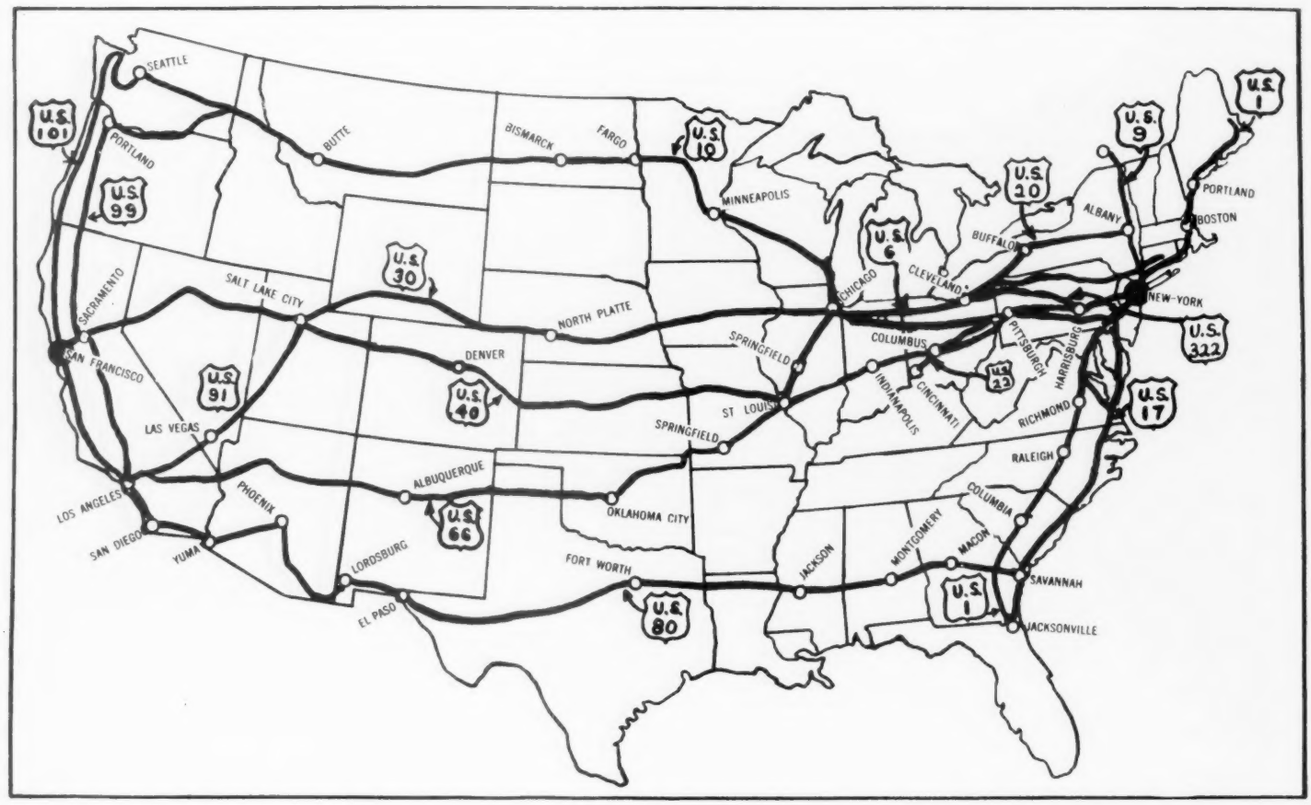
Universal service as well as Universal processes has helped him all the way along

They will help you, too

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

U. S. Highways where touring will be best in 1940



The U. S. Highways shown on the map are those where tourist tra vel will be heaviest in 1940, with both the New York and San Francisco fairs open again, as they have officially announced. The map is based on data on tourist travel in 1939 gathered by Continental Oil Co.'s travel bureau

Fairs Make More Tourists Who Spend Less En Route

MOTOR touring in this country in 1940 will be 10 per cent greater than in 1939.

Close to 50,000,000 tourists will take interstate vacation trips in 13,500,000 cars, Continental Oil Co.'s Travel Bureau estimates for NATIONAL PETROLEUM NEWS.

This bureau also estimates these tourists will spend $5,000,000,000 on their trips in 1940. The U. S. Travel Service at Washington estimates motor tourists will spend more than this vast sum.

At least $1,000,000,000 will be spent for gasoline, oil and in the care of automobiles. This is about 12 per cent of the oil industry's total sales to motorists in this country.

Based on 1939 experience, motor tourists in 1940 will travel longer distances than in normal touring, to reach the San Francisco and New York fairs, and will spend less en route.

States on the main highways feeding travel to the two fairs will again, as in 1939, benefit most from 1940 touring.

If all the Americans who normally visit Europe, but stay at home this year because of the war, spent their vacations touring in this country, the additional volume of business would be only four per cent of what will be spent anyhow in touring.

The accompanying analysis of motor touring in the U. S. in 1939 and the forecast for 1940 was prepared exclusively for NATIONAL PETROLEUM NEWS by Joe N. Thompson, of Denver, director of the Conoco Travel Bureau.

By Joe N. Thompson

Director Conoco Travel Bureau

The great puzzle of the 1939 tourist season revolved around the question: "How could there be so many tourists on the road and yet business not be any better than it was?" The answer is simple, however, and lies in the fact that the fairs in San Francisco and New York controlled the traffic trends of the nation last year.

The number of motor tourists traveling in 1939 was 11 per cent greater than in 1938. But, due to the great distances they traveled in getting to the fairs, it was necessary for them to drive so fast that few stops were made. Thus a lesser number of tourist days were spent at intermediate points. Except in California and New York, while there were more tourists, they spent

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less than had they been traveling more leisurely. Tourist states off the main arterial lanes of travel experienced the most adverse effects in this respect.

Over the entire country, we estimate that 45,000,000 motor tourists, traveling in about 13,000,000 cars, took interstate vacation trips in 1939, averaging 3685* miles each, and spent $4,500,000,000 in their travels.

The fairs had several unusual effects on national motor travel. First, the number of cars was greater. Second, the average length of all vacation trips increased by about 10 per cent, or from an average of 3450 miles in 1938 to approximately 3685 miles in 1939.

As stated previously, the American motor tourist has two important limitations on his traveling. The first is money. He has only about $100 per individual to spend on his vacation trips. He travels with his family, which includes a group averaging 3.5 persons to each car. The second limitation is time. He has an average of two weeks for his entire vacation trip.

In order to travel the longer distances to get to the two fairs, it was necessary to travel much faster than was customary and also to economize on expenses en route, in order to have sufficient money at the destination points to see the fairs. This resulted in many touring families stopping only a few hours on the road to gain a few snatches of rest at hotels or tourist camps. In extreme cases tourists drove straight through to the fairs, in relays of drivers.

U. S. Highway 6, skirting across the northern frontiers of Pennsylvania, Ohio, Indiana and Illinois, probably enjoyed the greatest increase in the volume of traffic in 1939 of any highway in the eastern section of the country. It was one of the arterial lanes of traffic feeding the travel from the densely populated middle western regions to the New York fair. U. S. Highways 22 and 30, the latter known as the Lincoln Highway (both being feeders from the middle west), probably carried the largest volume of tourist traffic in the country in 1939. U. S. Highway 1, feeding into New York City from both north and south and normally carrying the largest volume of traffic of all kinds every year, enjoyed a considerable increase in tourist travel due to the New York fair.

The effect of the San Francisco fair in attracting motor tourists can be accurately measured. California is the only state that counts every foreign car that crosses its borders. The California Department of Public Works reports that, for the first eight months of 1939, a total of 362,728 out-of-state passenger cars entered California, an increase of 21.5 per cent over the same period in 1938. If we ascribe all of this increase to the Exposition, which is more than a fair, since there would have been a normal increase anyhow, then the 1939 Exposition attracted 64,296 foreign cars containing 225,036 persons during this period.

Several transcontinental routes served the San Francisco fair. The Lincoln Highway, which is U. S. Highway 30 as far west as Salt Lake City, enjoyed the greatest increase over 1938, due to the fact it was the logical route from the densely populated middle west. The completion of Colorado and Utah's U. S. Highway 40 across the Continental Divide resulted in the use of this route by many middlewesterners who went to San Francisco. This route traverses the so-called Roof Garden of America, the highest section of the Rocky Mountains.

A favorite route to San Francisco for southwestern motorists was either U. S. Highway 66 traversing the northern portions of Texas, New Mexico and Arizona, or U. S. Highway 80, which crosses central Texas and the southern portion of New Mexico and Arizona near the Mexican border. This route, U. S. Highway 80, part of which is known as the Broadway of America, carries more traffic of all kinds, year in and year out, than any other transcontinental lane of travel in the country. It is preferred by many eastern tourists because it traverses no important mountain barrier. It obtains the largest amount of transcontinental

*Conoco Travel Bureau measures the mileage of the interstate tours of a representative cross section of motorists using its service and this data is used in arriving at its estimate of the average mileage of interstate tours.

The Perfect Mixture

A mixture of power, speed and efficiency properly blended to give more service at lower cost ... that's Roper Pumps! As the French chef blends talent with ingredients to make a superior dish, so do Roper engineers, designers and master craftsmen blend knowledge, experience and metals to make a superior pump.

The result is . . . pumps with greater smoothness of operation . . . more power . . . higher speeds . . . lower power consumption . . . and longer life. That's what might be called a large order, but you'll find Roper can fill it! Get the facts and the proof.

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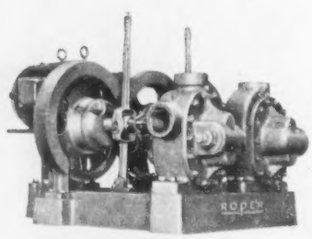
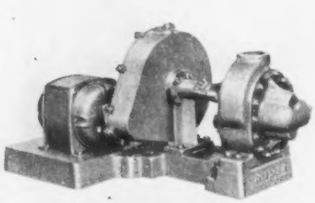


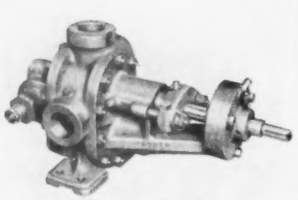
TWIN PUMP UNIT

ROPER

Rotary PUMPS



SINGLE PUMP UNIT



TRUCK PUMP

Dependable Since 1857

winter traffic because of its far southern location and mild weather.

Many middlewesterners and southwesterners made a circle trip to San Francisco, going by one of the southern routes and returning by the Lincoln Highway, the northern route. U. S. Highway 10, in North Dakota, had the greatest percentage of increase in tourist travel of any highway in the country in 1939. This was due to the completion of hard surfacing on this highway, which made it possible for tourists traveling west from Minnesota, Wisconsin and Michigan to use it with great convenience. The North Dakota State Highway Department reported an increase in traffic on this highway of about 125 per cent over 1938.

Outlook for 1940

What does this indicate for motor travel in 1940? Well, travel in 1940 will be much like that of 1939, since both fairs will be held again.

Our estimate for 1940 is that it will be the greatest travel season in history. It is reasonable to expect a 10 per cent increase in tourist travel. We estimate that something close to 50,000,000 American motor tourists will take interstate vacation trips in about 13,500,000 automobiles, averaging 3800 miles on each trip and will spend a total of approximately $5,000,000,000. Since we can now count definitely on both fairs being held, we can assume that tourists, as in 1939, will travel long distances to reach San Francisco and New York City, that they will economize en route and travel rapidly in order to reach these destination points and to have sufficient money to do the fairs.

Again, as in 1939, tourist states off the arterial lanes of traffic will not do as well as those tourist states on the important lanes of traffic. In the east, U. S. Highways 1, 6, 22 and 30 will carry the bulk of the tourists to New York. In the west, U. S. Highways 10, 30, 40, 66 and 80 will bear the brunt of the traffic to San Francisco.

Something in excess of $5,000,000 will be spent in 1940 in advertising by various states, sections and organizations, to prevail upon tourists to visit their areas; but the two fairs, as in 1939, will control the tourist traffic trends. They will be the important destination points.

Of the total of $5,000,000,000 to be spent in 1940 by the American motor tourists, 20 per cent, or about $1,000,000,000 will go to purchase gasoline, motor oil and other products to propel the 13,500,000 vehicles. This intake from the tourist industry represents about 12 per cent of the petroleum industry's total sales to the American motorist.

The war in Europe, in spite of all optimistic predictions, will probably not have any great beneficial effects upon travel in this country in 1940. The above estimate of tourist expenditures, the tremendous sum of $5,000,000,000, is based upon two important factors; first, improved economic conditions, and, second, the stimulus given to travel by the two fairs to be held again this year.

The fact that American tourists cannot visit Europe in 1940 can have but small bearing upon these huge expenditures. During the last several years less than 200,000 Americans have taken out passports annually to go overseas. Their expenditures in foreign countries amount to approximately $200,000,000 annually. This represents less than 1.5 per cent of our domestic motor travelers and only 4 per cent of their total domestic expenditures. Assuming that each of these foreign travelers should convert himself in 1940 into a typical American tourist, it will help a little, but it is likewise true it will not have any great effect upon an industry that is already stupendous in size.

New York-San Francisco Fairs Will Again Be Tourists' Mecca

The two World Fairs, at San Francisco and New York, now definitely announced to reopen, will be the outstanding attraction for motor tourists in 1940. The New York fair will open May 11 and close Oct. 27. The San Francisco fair opens May 29 and will close Sept. 29.

However, many other annual festivals and events over the country are growing in popularity, are more widely advertised and will draw more motor tourists this year than ever before.

One state has a celebration in 1940. New Mexico's Cuarto-Centennial runs from May to October. Principal industrial exhibit of the year is the International Petroleum Exposition at Tulsa, May 18-25. It will draw many thousand oil men who will drive from Kansas, Oklahoma, Texas and other states.

Listed below are some of the attractions which draw visitors from other parts of the country, as recorded by the U. S. Travel Bureau at Washington, a part of the National Park Service. This bureau will later publish an official calendar of several hundred of these events, available to oil companies on request.

These attractions do not include events of interest over a limited territory, such as the county and state fairs, nor the thousands of football

TO ENGINE VARNISH

The industry faces a serious problem in engine varnish—that tacky substance which commits sabotage in modern motors. By clinging to the pistons, valves and cylinder walls, it causes serious trouble.

Conewango engineers have licked engine varnish with a new refining process called Selective Adsorption. This process, used *exclusively* for Conewango Process Motor Oil, removes varnish forming ingredients and improves lubricating qualities.

The pistons shown above were run at Pennsylvania State College under identical conditions; the first with a high grade, conventionally refined Pennsylvania oil, the second with Conewango Process Oil of the same S.A.E. grade. Note how Selective Adsorption virtually eliminates varnish formation!

This revolutionary development offers unusual profits to alert dealers and jobbers. Write now for complete information.

Conewango Process
VARNISH FREE
MOTOR OIL

Fine Pennsylvania Oil
MADE FROM THE HEART OF THE CRUDE
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THE CONEWANGO REFINING CO.
WARREN, PENNA.

games held on eight or ten Saturdays during the fall, attendance at which draws millions of outsiders who drive in cars and make a week-end trip. All told, these events will swell gasoline consumption in what will be the nation's biggest year for motor touring.

January—

Mardi Gras season at New Orleans opens Jan. 6.

Saint Paul, Minn., Winter Carnival, principal events Jan. 26.

February—

Ski Jump Meet, Lake Arrowhead, Cal., Feb. 2-3.

Chinese New Year Celebration, San Francisco, Feb. 7-13.

Bobsled Championship races and winter events, Lake Placid, N. Y., Feb. 22-23.

March—

All Indian Show, Phoenix, Ariz., March 9-10.

Easter Service, Grand Canyon, Ariz., March 24.

Natchez Pilgrimage, Natchez, Miss., March 24-April 7.

Mardi Gras, New Orleans, final date March 23.

April—

Azalea Festival, Charleston, S. C.

Japanese Cherry Blossoms Festival, Washington.

May—

Kentucky Derby, Louisville, May 4.

International Petroleum Expo, Tulsa, May 18-25.

500-Mile Auto Race, Indianapolis, May 30.

Tulip Festival, Holland, Mich.

June—

Harvard-Yale Regatta, New London, Conn.

Portland Rose Festival, Portland, Ore., June 7-10.

June Week, Annapolis and West Point.

American Folk Song Festival, Ashland, Ky.

July—

Frontier Days, Prescott, Ariz.

Frontier Days, Cheyenne, Wyo.

August —

Negro Song Festival, Gulfside, Miss.

Paul Bunyan Exposition, Brainerd, Minn.

Southern Cal. Twin Convention, Los Angeles.

September—

National Women's Golf Championship, Del Monte, Cal., Sept. 23-29.

Pendleton Roundup, Pendleton, Ore.

Miss America Beauty Pageant, Atlantic City.

October—

"Veiled Prophet" Celebration, St. Louis.

Mountain States Forest Feast, Elkins, W. Va.

American Indian Exposition, Tulsa.

November—

Los Pasados, Claremont, Cal.

December—

International Livestock Exposition, Chicago.

Exchange Rate Favors Touring in Canada

CLEVELAND—Despite the fact Canada is at war with Germany, its officials foresee no restrictions on touring there by U. S. motorists in 1940. In fact, a difference in currency exchange, amounting to about 11 per cent now in favor of the American dollar, and the opening of two new scenic highways in eastern British Columbia and western Alberta province, are likely to increase the number of U. S. motor tourists who take their 1940 vacations in Canada.

The difference in the exchange rate would mean that the vacation dollars U. S. tourists take into Canada, or exchange at the border for Canadian currency, will go farther in paying for hotels, meals, fishing licenses, guides and the commodities they buy there to bring back with them.

All that a U. S. motorist needs to tour in Canada is identification showing citizenship unless he was born in the U. S., car registration certificate and driver's license, if he comes from a state which requires a driver's license. The same customs declaration which applied in peace time is still in effect.

The two new Canadian scenic highways opened since the last touring season are the Big Bend and the Banff-to-Jasper highway. The Big Bend highway circles the Columbia ice fields and Glacier National Park, running about 250 miles from Revelstoke to Golden, B. C. It runs parallel to the Columbia river north to its junction with the Canoe river, then turns south, still paralleling the Columbia, to Golden. The Banff-to-Jasper highway goes through about 200 miles of national parks, the Jasper and Banff parks, crossing many passes in the Canadian Rockies.

Both these highways can be reached from the U. S. through northern Washington and Montana.

ONE *Revolutionary* DEVELOPMENT GIVES YOU ALL THESE ADVANTAGES

50% to 75% Saving
IN EVAPORATION AND STORAGE LOSSES

NO MECHANICAL PARTS
No Upkeep—No Labor Cost for Inspection—No Binding, Sticking or Freezing at Critical Moments

POSITIVE PROTECTION
Against Tanks Bursting or Buckling
Positive Operation—No Dependence on Human Element—No Parts to Bind or Stick.

MINIMIZES FIRE HAZARD

KEEPS DUST AND MOISTURE OUT OF TANK

PROTECTS QUALITY BY RETAINING LIGHT ENDS

★ The advantages outlined above are revolutionary, but there is no guesswork about them . . . all have been proved by the everyday experience of users—experience which demonstrates conclusively that ECONO-VENT provides *greater* protection than has ever been possible before, plus complete freedom from mechanical attention, plus *50% to 75% savings in evaporation and storage losses* . . . To delay investigation of ECONO-VENT is to postpone its advantages.

Write for complete data today.

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SAVE WITH *Econo-vent* LIQUID SEAL TANK VENT
The New Type Tank Vent with the Revolutionary **LIQUID SEAL**

New Automotive Type Tractors Expand Farm Motor Fuel Market

GREATER income from U. S. farms in 1940 and the growing use of modern power machinery on farms, will expand this market for petroleum products this year, state U. S. Department of Agriculture officials at Washington. Looking even further ahead, they predict for the next decade a steadily increasing consumption of oil products on farms.

There were 1,652,650 tractors in operation on U. S. farms on July 1, 1939, this government agency reports. This is an increase of nearly 5 per cent from the 1,577,233 tractors on farms July 1, 1938. At the start of 1937 there were but 1,314,000 tractors on farms in this country.

A study of motor vehicles and fuels used on farms, made in 1938 by the Ethyl Gasoline Corp. in co-operation with 40 farm journals, showed an average annual consumption per tractor per year of 1070 gals. This included all types of tractors, using premium, regular and third grade gasoline as fuel and also kerosine, distillate and diesel fuel. Using the figure given in this survey, a farm market for tractor fuels of nearly 1,770,000,000 gals. (42,143,000 bbls.) was indicated as of the middle of 1939. This figure will be increased in 1940.

There are now 1,250,000 trucks in use on farms in the U. S., the WPA at Washington reports, after a survey of automottive equipment on farms preliminary to the census to be made in 1940. The study of the Ethyl Gasoline Corp. showed an average consumption of 910 gals. a year by farm trucks. This indicates a total market for motor fuel for trucks on farms of 1,137,500,000 gals. (27,110,000 bbls.)

There are 4,500,000 to 5,000,000 passenger cars owned by farmers now, the WPA believes the 1940 census will show. It believes that from 65 to 70 per cent of farms will report owning automobiles, as against 58 per cent owning cars in 1930.

On the basis of 520 gallons a year consumption of motor fuel in passenger cars owned by farmers, as reported in the Ethyl Gasoline Corp. survey, a total consumption of motor fuel of at least 2,340,000,000 gals. (55,900,000 bbls.) is indicated for 1940.

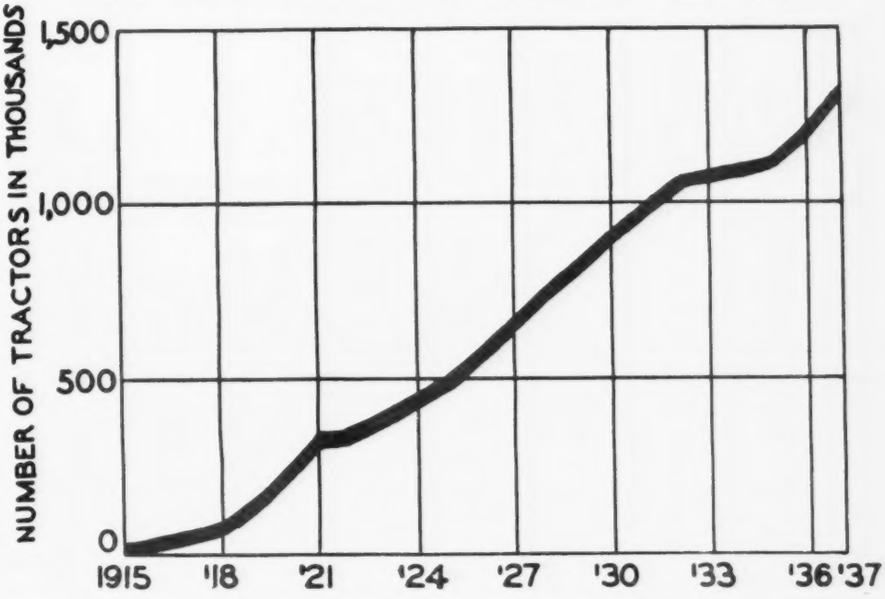
Thus, from the use of tractors, trucks and passenger cars on the nearly 7,000,000 farms in the U. S., a total market for motor fuels and tractor fuels of all kinds of over 5,250,000,000 gals. (125,000,000 bbls.) is indicated for 1940.

In addition, the government agencies state the oil industry's farm market is also being increased through the use of other types of power machinery and the use of modern conveniences for homes which consume petroleum. Included among these are stoves for cooking and water heaters which operate on kerosine or range oil or liquefied gas, and refrigerators operating on kerosine.

This increase in farm income will be both from funds received by farmers in marketing their crops and from the federal benefit payments, which will be continued to farmers in 1940 at about the same rate as in 1939, it is believed in Washington.

Economists with the Department of Agriculture at Washington estimate that 1940 farm income will be almost as large as in 1937, when the $9,111,000,000 cash income of farmers reached

How Farm Tractor Fuel Market is Growing



The total number of tractors of all types on U. S. farms, from 1915 to 1937, from a study made by the WPA. Later figures, shown in an accompanying table, indicate at least an equivalent rate of increase in 1938 and 1939

• • •

Edsell Ford at the wheel of one of the new Ford-Ferguson tractors, plowing a demonstration furrow at the New York Fair. These tractors have automotive type engines with a displacement of 120 cubic inches and use gasoline as fuel. They sell for about $600, without attachments, delivered within 200 miles of Detroit. Gasoline consumption of this type of tractor is about one gallon per hour of operation

● *This photograph was taken one week after start of construction. Note easy erection in large units, permitting fast construction in any weather.*

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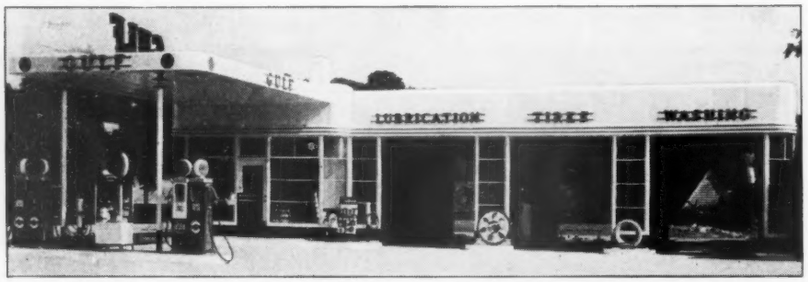

● *This photograph of a southern type building, one of 40 stations fabricated and erected for the Gulf Refining Corp., shows the modern appearance of a finished Frameless Insulated Steel Station.*

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IN CANS — DRUMS — TANK CARS

Write for **PRICES**

Buyers cans received—stored—filled and shipped as wanted.

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ESTABLISHED 1924

the highest point since 1929. In 1939 farm income was only $8,300,000,000. The 1939 income was made up of $7,625,000,000 received from marketing crops and $675,000,000 from federal benefit payments.

In making its forecast of 1940 farm income, the department stated: "The probable supply and demand conditions for farm products in general indicate a material improvement in income from farm marketings, with practically all groups of commodities sharing in the increase."

The plans of the department, which are not yet authorized by Congress, call for setting aside $725,000,000 for farm benefit payments in 1940. This includes $500,000,000 for soil conservation payments and $225,000,000 for the so-called "parity" payments to growers of wheat, corn, cotton, tobacco and rice. These payments are made to farmers to make up the difference between the market value of the commodities raised and the price fixed by the government as bringing a fair return to the farmer for his crop.

In addition to the direct farm benefit payments by the government, farmers will continue to receive in 1940, in about the same extent as in 1939, Farm Security Administration payments and loans, for enabling farmers to get a new start, and Farm Credit Administration loans, to enable them to acquire "capital goods" seeds and other necessities to carry on their farming operations. The volume of these loans to farmers in 1939 by the above and other government agencies is not available, but the total for all states in 1938 was $740,900,000, as compared with $484,000,000 in 1937. Federal benefit payments, or grants, to farmers in 1938 by the Agricultural Adjustment Administration, the Farm Security Administration and the Federal Surplus Commodities Corporation were $444,800,000 in 1938 and $587,127,000 in 1937.

The statement there are now over 1,650,000 tractors on U. S. farms was coupled with the prediction that more than twice this number will be in operation by 1945, by J. J. Frey, head of the technical sales division of the Ethyl Gasoline Corp. Mr. Frey told oil men and heads of manufacturing concerns in New York recently.

The modern tractor is built along automotive lines, he stated, with the engine, clutch, transmission, differential, axles and other parts similar to those found in trucks. Thus a mechanic will tackle a tractor repair job with the same confidence he has when he goes to work on an automobile or truck. Also, the farmer uses the same petroleum products in the modern tractor that he uses in his car, he stated, the same gasoline, crankcase oil and lubricants.

Where, even four years ago, most two-plow tractors sold for over $1000 on steel wheels, or at the rate of more than $50 or $60 per horsepower, Mr. Frey said that today, high compression, two-blow tractors on rubber are

available for several hundred dollars less, at a cost as low as $25 per horsepower. "The new tractors use pounds of lubricating greases, where they formerly required gallons," he said. "Crankcase capacities are smaller because the dilution problem has been removed. Radiator capacities have decreased sharply, are now three to four gallons, as compared with 12 to 15 in the older types."

The lower relative consumption of fuel and lubricants by the new types of tractors is more than offset, it has been brought out, by the greater use to which the tractors are put on farms. Mr. Frey brought out that the improvement in the power-weight ratio has accompanied reductions in cost per horsepower with the new tractors. Four years ago he said it required 230 pounds of tractor or more to produce one horsepower, whereas today 70 pounds produces one horsepower.

"The net results of these vast improvements in efficiency in the modern tractor is lower first cost, lower operating costs and lower maintenance costs," he said, "and the farmer has shown his approval by buying as many tractors in the last three years as he did in the previous ten years."

Distribution of Tractors on U. S. Farms

(From data by Implement & Tractor)

	July 1 1938	July 1 1939	% Inc. in 1939
Alabama	10,127	11,005	8.67
Arizona	5,047	5,307	5.15
Arkansas	14,320	14,666	2.42
California	65,172	66,727	2.39
Colorado	17,488	18,408	5.26
Connecticut	4,492	4,910	9.31
Delaware	3,272	3,695	12.93
Florida	10,497	10,929	4.12
Georgia	12,219	13,040	6.72
Idaho	8,523	9,325	9.41
Illinois	139,580	147,200	5.46
Indiana	82,272	87,441	6.28
Iowa	129,962	135,262	4.08
Kansas	94,165	98,506	4.61
Kentucky	11,512	12,818	11.34
Louisiana	11,494	12,510	8.84
Maine	5,181	5,253	1.39
Maryland	12,348	13,162	6.59
Massachusetts	6,104	6,415	5.10
Michigan	57,671	60,136	4.27
Minnesota	86,288	91,389	5.91
Mississippi	15,115	16,478	9.02
Missouri	50,525	52,705	4.31
Montana	22,840	23,408	2.49
Nebraska	67,449	71,235	5.61
Nevada	452	482	6.64
New Hampshire	1,597	1,674	4.82
New Jersey	12,786	13,498	5.57
New Mexico	5,098	4,994	2.04*
New York	60,745	63,046	3.79
North Carolina	20,236	21,452	6.01
North Dakota	51,278	52,098	1.60
Ohio	82,554	87,374	5.84
Oklahoma	45,540	47,055	3.33
Oregon	13,381	14,127	5.58
Pennsylvania	52,645	54,991	4.46
Rhode Island	989	1,024	3.54
South Carolina	5,981	6,676	11.62
South Dakota	45,960	46,103	0.31
Tennessee	12,585	13,603	8.10
Texas	102,683	108,037	5.21
Utah	2,652	2,840	7.09
Vermont	3,593	3,700	2.98
Virginia	13,254	14,041	5.94
Washington	12,680	13,660	7.73
West Virginia	3,641	4,108	12.83
Wisconsin	76,900	80,341	4.47
Wyoming	5,394	5,800	7.53
Total United States	1,577,233	1,652,654	4.78

*Decrease

Sentinels on guard for you

Here is the heart of the protection given you at General American Terminals. Entirely separate lines and pumps for dissimilar commodities insure you against contamination. These valves and pipes make it mechanically certain that your commodity will flow through the *right* pipe to the *right* tank, designed specifically for *your* type of liquid. Men and modern facilities "team up" to protect you completely. Join the list of world-leaders who use General American facilities.

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Corpus Christi, Texas
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A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

Markets

Pennsylvania

CLEVELAND, Jan. 22. — Lower prices were reported by some western Pennsylvania refiners for several products last week, including bright stock, wax and "Q" gasoline. Kerosine on the other hand was quoted 0.25c higher by many refiners.

Bright stock, 25 pour test, was down 1c on the low and 2c on the high of the price range at 29 to 32c. White crude scale was offered at 5.50 to 6.25c a lb., New York, off 0.75c on the low and 0.5c on the high. Export demand for both bright stock and wax was said to have subsided considerably.

Three lower field refiners reported withdrawing their quotations for ordinary U. S. Motor gasoline, one of them adding that he was now leading all of his production. Two other lower field refiners quoted 4.50c for U. S. Motor. "Q" gasoline was offered 0.125 to 0.25c lower at 5.50 to 5.75c in the lower field. Some refiners quoting these prices said they were "meeting competition in some areas."

Mid-Western

CHICAGO, Jan. 20.—With the middle west "snowed in" with the coldest weather of the year, refiners' light fuel quotations, with the exception of No. 1 straw, were up 0.125 cent, according to reports here the past week.

Refiners' quotations ranged from 3.625 to 3.875c for range oil, 3.625 to 3.75c for No. 1 p.w., 3.50c for No. 1 straw, 3.375c for No. 2 straw, and 3.25c for No. 3 fuel, f.o.b. Group 30. Two tank car marketers reported quotations 0.125c under refiners' lows for some grades, while other marketers' quotations were the same or higher than refiners' lows.

A marketer reported selling one car of range oil at 3.625c, 3 cars of No. 2 straw at 3.375c, and 3 cars of No. 3 fuel at 3.25c. Another marketer reported selling six cars of burning oil open spot; prices were not disclosed.

A refiner who previously had reported price of $0.55 a bbl. for No. 6 fuel oil the past week said he was quoting $0.45. One other refiner quoted $0.50 for this grade and a tank car marketer quoted $0.45, f.o.b. Group 3. One refiner quoted $0.70 for No. 5 fuel oil.

Four refiners reported 0.125c reductions in their gasoline quotations, effecting reductions in the highs of price ranges for the three higher octane grades. Refiners' quotations ranged from 3.875 to 4.25c for 62 octane and below, 4.125c for 63-66, 4.375 to 4.875c for 67-69, and 4.625 to 5.125c for 70-72 octane, f.o.b. Group 3. Tank car marketers' gasoline quotations generally were 0.25 to 0.5 cent under refiners' low quotations.

Sale of two cars of Texas 70-72 octane leaded gasoline at 4.125c was reported by a marketer. Another marketer said that he sold two cars of 63-66 octane gasoline at 3.875c, f.o.b. Group 3.

A marketer reported selling two cars of 41-43 kerosine at 3.625c. Refiners' quotations were reported unchanged, ranging from 3.625 to 4.25 for 41-43, and 3.75 to 4.625 for 42-44, f.o.b. Group 3. Some marketers said that most of their kerosine and light fuel oil sales were from southern Illinois refineries and not from the Mid-Continent.

NOTICE

A careful investigation shows that no prices will be available for "65 octane & above" gasoline in Atlantic Coast districts after Feb. 1. Because two suppliers who have been quoting this bracket tell us that they will discontinue this bracket after Feb. 1, OILGRAM will discontinue publishing prices for "65 octane & above."

Gulf

NEW YORK, Jan. 20.—An apparent tightening of fuel oils at the Gulf held the attention of cargo traders the past week. A New York broker said he had found it necessary to buy a cargo of gasoline in order to get a cargo of No. 2 fuel. Reports of other similar transactions were heard.

An unconfirmed report that four cargoes of Bunker "C" fuel had been sold at $0.98 a bbl. was discounted by one large refiner here, who said he had heard of the sale of one cargo. "I doubt very much if there were four cargoes of Bunker 'C' available at the Gulf," he added.

Quotations reported for Grade "C" in cargoes at the end of the past week ranged from $0.97 to $1.05 a bbl., up 2c on the low and 5c on the high from quotations reported the previous week.

Gasoline was quoted 0.25 to 0.375c lower by one large refiner. His new prices effected reductions of 0.125 and 0.5c on the lows of price ranges for 400 e.p., 68 and 70 octane gasolines, to 5.75 and 5.875c, respectively. Similar reductions were effected in the highs of price ranges for other end point grades.

Atlantic Coast

NEW YORK, Jan. 20.—Posted prices for No. 6 and Bunker "C" fuel, ships' bunkers, were up from 10 to 35c a bbl. at many Atlantic Coast points the past week. Demand for fuel oils since the first of the year has been about 40% greater than during the same period last year, four large companies said.

Although suppliers generally were posting the same prices for Bunker "C" fuel, only two companies reported firm open spot quotations of $1.50 at New York. One of these companies also quoted $1.50 at Norfolk, Portland, Boston and Providence, $1.45 at Savannah and Jacksonville, and $1.40 at Tampa. Open spot quotations of $1.25 and $1.50 were reported by two companies, respectively, for No. 6 and Bunker "C" at Philadelphia, and one of these companies also quoted $1.25 for No. 6 fuel only at Baltimore. One company reported spot quotation of $1.70 for No. 6 at Albany.

Gasoline was said to be "spotty." Lower prices for 60-64 and 72-74 octane gasolines were reported by three suppliers at Savannah, Jacksonville, Miami and Tampa. At least one large company at New York indicated gasoline was in "pretty good shape."

No changes were reported in quotations for kerosine or light fuel oils.

Mid-Continent

TULSA, Jan. 20.—Demand for light fuel oils in the Mid-Continent received further impetus the past week as temperatures in the middle west took a nosedive. Virtually all orders received were against contracts, according to reports. Several refiners, however, said they were buying in the open market and reported supplies were "closely held." Quotations reported by Mid-Continent refiners generally were unchanged.

Some Texas refiners reported reducing their gasoline quotations 0.125 to 0.5c, effecting 0.25 to 0.375c reductions in West Texas, and 0.125c in North Texas, published prices. Gasoline shipments from Mid-Continent plants were off considerably due to

(*Continued on page* 47)

N.P.N. Gasoline Index

	Dealer T.w. Cents per	Tank Car Gallon
Jan. 22	9.79	5.97
Month ago	9.56	6.15
Year ago	9.52	5.40

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, FOB refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted

Gasoline

Prices Effective	Jan. 22	Jan. 15
OKLAHOMA Refiners' Quotations & Sales Prices		
U. S. Motor: (Oct. L-3)		
62 oct. & below	3.875– 4.25	3.875– 4.25
63-66 oct.	4.125–4.5625	4.125–4.5625
67-69 oct.	4.375– 4.875	4.375– 5.00
70-72 oct.	4.625– 5.125	4.625– 5.25
60-62 400 e.p.	(c) 4.125–4.25	(c) 4.125–4.25
WESTERN PENNA. REFINERS' QUOTATIONS		
Bradford-Warren:		
Motor gasoline:		
U.S. Motor (58-62°)	(a) 4.75 –5.00	(a) 4.75 –5.00
Min. 65 oct.	6.50 – 6.75	6.50 – 6.75
"Q" gasoline	6.75	6.75
75-76 oct. (L-3)	(a)7.05	(a)7.05
Other districts:		
Motor gasoline:		
U. S. Motor (58-62° gravity):	4.50	4.50
66-68 oct. (L-3)	(a)6.00	(a)6.00
"Q" gasoline	5.50 – 5.75	5.75 – 5.875
75-76 oct. (L-3)	(a)6.25	(a)6.25
CENTRAL MICHIGAN (h)		
Str.-Run Gasoline	(i) 4.00 –4.25	(i)4.25
U.S. Motor: (Oct. L-3)		
67-69 oct.	(c)6.25	(c)6.25
72-74 oct.	6.00 – 7.00	(c)7.00

Prices Effective	Jan. 22	Jan. 15
CALIFORNIA		
U. S. Motor:		
54-58 gravity, for in-state shipment	5.75 – 9.00	6.00 – 9.25
54-58 gravity, for out-side state shipment	6.50 – 9.00	6.50 – 9.00
58-61 gravity, 375-400 e.p., 65 oct. & above	7.50 – 9.75	7.50 – 9.75
N. TEX. REFINERS' QUOTATIONS (b)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	3.875– 4.25	3.875– 4.25
63-66 oct.	4.125– 4.25	4.125– 4.50
67-69 oct.	4.375– 4.50	4.375– 5.00
70-72 oct.	4.625– 5.00	4.625– 5.25
60-62, 400 e.p.	(c) 3.875–4.00	(c) 3.875–4.00
KANSAS (For Kansas destinations only)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(e)4.375	(e)4.375
67-69 oct.	(e)4.625	(e)4.625
70-72 oct.	(e)5.125	(e)5.125
W. TEX. REFINERS' QUOTATIONS (b)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(c) 4.00 –4.375	(c) 4.375–4.50
63-66 oct.	(a) 4.625–4.875	(a) 4.625–4.875
67-69 oct.	(c) 4.50 –4.875	(c) 4.75 –4.875
70-72 oct.	(c)5.00	(c) 5.00 –5.125

Prices Effective	Jan. 22	Jan. 15
CENT. W. TEX. REFINERS' QUOTATIONS (Prices to truck transports)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(a)4.125	(a)4.25
63-66 octane	(a)4.75	(a)4.875
66-70 octane	(f)	(f)
E. TEX. REFINERS' QUOTATIONS		
U. S. Motor: (Oct. L-3)		
70-72 oct.	(a)4.75	(a)4.75
60-62, 400 e.p.	(a)4.25	(a)4.25
N. LA. REFINERS' QUOTATIONS (For shipment to La. & Ark.)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(a) 4.125–4.375	(a) 4.125–4.375
63-66 oct.	(a) 4.375–4.625	(a) 4.375–4.625
70-72 oct. leaded	(a) 4.875–5.125	(a) 4.875–5.125
ARKANSAS REFINER'S QUOTATIONS (F.o.b. Ark. plant of one refiner, for shipment to Ark. & La.)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.25	4.25
67-69 oct.	4.75	4.75
70-72 oct.	5.00	5.00
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
70-72 oct.	7.50	7.50

(Continued on next page)

MID-WESTERN REFINERS' TANK CAR QUOTATIONS

Prices in this Midwestern Refiners' Tank Car Market table are gathered from refiners from their offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight rate basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. All other gasoline prices are given by and for the particular refining district where the material is made and from which it is shipped.

Gasoline

Prices Effective	Jan. 22	Jan. 15
U. S. Motor: (Oct. L-3)		
62 oct. & below	3.875– 4.25	3.875– 4.25
63-66 oct.	(c)4.125	(c)4.125
67-69 oct.	4.375– 4.875	4.375– 5.00
70-72 oct.	4.625– 5.125	4.625– 5.25

Kerosine

41-43 grav. w.w.	3.625– 4.25	3.625– 4.25
42-44 grav. w.w.	3.75 – 4.625	3.75 – 4.625

Fuel and Gas Oils

Prices Effective	Jan. 22	Jan. 15
No. 1 p.w.	3.625– 3.75	3.50 – 3.75
No. 1 straw	(c)3.50	(c)3.50
No. 2 straw	3.375	3.25 – 3.375
No. 3	3.25	3.125– 3.25
No. 5	(a)$0.70	(a)$0.70
No. 6	(c) $0.45–$0.50	(c) $0.50–$0.55
Range oil	(c) 3.625–3.875	(c) 3.625–3.875

Naphtha and Solvent

Prices Effective	Jan. 22	Jan. 15
(FOB Group 3 as quoted by two Chicago sellers)		
Stoddard solvent	6.375	6.375
Cleaners' naphtha	6.875	6.875
V. M. & P. naphtha	6.875	6.875
Mineral spirits	5.875	5.875
Rubber solvent	6.875	6.875
Lacquer diluent	7.875	7.875

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended Jan. 19, 1940)

	Jan. 15	Jan. 16	Jan. 17	Jan. 18	Jan. 19
U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):					
62 octane and below:					
Oklahoma	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25
(a) North Texas	3.875– 4.25	3.875– 4.25	3.875– 4.00	3.875– 4.25	3.875– 4.25
West Texas	(c) 4.375–4.50	(c) 4.375–4.50	(c) 4.00 –4.375	(c) 4.00 –4.375	(c) 4.00 –4.375
Mid-Western (Group 3 basis)	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25
63-66 octane:					
Oklahoma	4.125–4.5625	4.125–4.5625	4.125–4.5625	4.125–4.5625	4.125–4.5625
(a) North Texas	4.125– 4.50	4.125– 4.50	4.125– 4.25	4.125– 4.25	4.125– 4.25
West Texas	(a) 4.625–4.875	(a) 4.625–4.875	(a) 4.625–4.875	(a) 4.625–4.875	(a) 4.625–4.875
Mid-Western (Group 3 basis)	(c)4.125	(c)4.125	(c)4.125	(c)4.125	(a)4.125
67-69 octane:					
Oklahoma	4.375– 5.00	4.375– 4.875	4.375– 4.875	4.375– 4.875	4.375– 4.875
(a) North Texas	4.375– 5.00	4.375– 5.00	4.375– 4.50	4.375– 4.50	4.375– 4.50
West Texas	(c) 4.75 –4.875	(c) 4.75 –4.875	(c) 4.50 –4.875	(c) 4.50 –4.875	(c) 4.50 –4.875
Mid-Western (Group 3 basis)	4.375– 5.00	4.375– 4.875	4.375– 4.875	4.625– 5.125	4.375– 4.875
70-72 octane:					
Oklahoma	4.625– 5.25	4.625– 5.125	4.625– 5.125	4.625– 5.125	4.625– 5.125
(a) North Texas	4.625– 5.25	4.625– 5.25	4.625– 5.00	4.625– 5.00	4.625– 5.00
West Texas	(c) 5.00 –5.125	(c) 5.00 –5.125	(c)5.00	(c)5.00	(c)5.00
East Texas	(a)4.75	(a)4.75	(a)4.75	(b)4.75	(b)4.75
Mid-Western (Group 3 basis)	4.625– 5.25	4.625– 5.125	4.625– 5.125	4.625– 5.125	4.625– 5.125
Motor Gasoline, 60-64 octane:					
New York harbor	(b)6.70	(b)6.70	(b)6.70	(b)6.70	(b)6.70
Philadelphia district	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75
Baltimore district	6.25 – 6.75	6.25 – 6.75	6.25 – 6.75	6.25 – 6.75	6.25 – 6.75
Motor Gasoline, 65 octane & above:					
New York harbor	(j) 6.50 –7.30	6.50 – 7.30	6.50 – 7.30	6.50 – 7.30	6.50 – 7.30
Philadelphia district	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75
Baltimore district	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	(a) 4.75 –5.00	(c) 4.75 –5.00	(c) 4.75 –5.00	(c) 4.75 –5.00	(c) 4.75 –5.00
Other districts (Western Penna.)	4.50	4.50	4.50	4.50	4.50
Motor Gasoline, Min. 65 octane:					
Bradford-Warren (Western Penna.)	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75
66-68 octane (L-3)					
Other Districts	(a)6.00	(a)6.00	(a)6.00	(a)6.00	(a)6.00
"Q" Gasoline:					
Bradford-Warren (Western Penna.)	6.75	6.75	6.75	6.75	6.75
Other Districts (Western Penna.)	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875
75-76 Octane: (L-3)					
Bradford-Warren (Western Penna.)	(a)7.05	(a)7.05	(a)7.05	(a)7.05	(a)7.05
Other Districts (Western Penna.)	(a)6.25	(a)6.25	(a)6.25	(a)6.25	(a)6.25

(a) One refiner quoting. (b) One supplier quoting. (c) Two refiners quoting. (d) Two suppliers quoting. (e) Prices nominal. (f) No quotations reported. (g) Prices FOB Central Michigan refinery group basis, for shipment within Michigan. Shipments may originate at plants outside Central group. (h) For shipment to Texas and New Mexico destinations. Group 3 prices quoted for northern shipment. (i) Excluding Detroit shipment. (j) Correction: This is correct price for Dec. 20 also, instead of 6.75-7.30 published on page 19 of Dec. 27 issue. (k) Correction: Correct price for Jan. 2 is 4.25c, instead of 4.25 to 4.375 as published on page 19 of Jan. 3 issue.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, FOB refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Natural Gasoline Prices

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

Prices Effective	Jan. 22	Jan. 15
FOB GROUP 3		
Grade 26-70	(m)2.25	(m)2.25
FOB BRECKENRIDGE		
Grade 26-70	(h)2.00	(m)2.00
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	6.00 – 6.25	6.00 – 6.25

Kerosine

WESTERN PENNA. REFINERS' QUOTATIONS

Bradford-Warren:		
45 grav. w.w.	4.875 – 5.00	4.875 – 5.00
46 grav. w.w.	(e)5.125	(e)5.125
Other districts:		
45 grav. w.w.	4.50 – 4.75	4.50 – 4.625
46 grav. w.w.	4.875	4.625 – 4.75
47 grav. w.w.	4.875 – 5.00	4.75 – 4.875
CENTRAL MICHIGAN (a)		
47-49 gravity w.w.	4.75 – 5.00	5.00 – 5.20
OKLAHOMA Refiners' Quotations & Sales Prices		
41-43 grav. w.w.	3.625 – 4.25	3.625 – 4.25
42-44 grav. w.w.	3.75 – 4.625	3.75 – 4.625
KANSAS (For Kansas destinations only)		
41-43 gravity w.w.	(e)4.00	(e)4.00
42-44 gravity w.w.	(e)4.25	(e)4.25
N. TEX. REFINERS' QUOTATIONS (b)		
41-43 grav. w.w.	(h)3.75	(h)3.75
E. TEX. REFINERS' QUOTATIONS		
41-43 grav. w.w.	(e)3.50	(e)3.50
N. LA. REFINERS' QUOTATIONS (For shipment to La. and Ark.)		
41-43 grav. w.w.	(e) 3.50 –3.75	(e) 3.50 –3.75
ARK. REFINER'S QUOTATIONS (F.o.b. Ark. plant of one refiner for shipment to Ark. and La.)		
41-43 grav. w.w.	4.00	4.00
CALIFORNIA		
40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00

Gas and Fuel Oils

WESTERN PENNA. REFINERS' QUOTATIONS

Bradford-Warren:		
36-40 gravity	(h)4.625	(h)4.625
Other districts: (Excluding Pittsburgh District Prices)		
36-40 gravity	3.875 – 4.50	3.875 – 4.50
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.75 – 5.00	4.75 – 5.00
No. 3 gas oil, Str.	4.375 – 4.50	4.25 – 4.50
U.G.I. gas oil	3.00 – 3.75	3.50 – 3.75
Fuel Oils (Vis. at 100):		
500-700 Vis.	(e)3.25	(e)3.25
300-500 Vis.	2.75 – 3.75	(h) 2.75 –3.50
100-300 Vis.	(e) 3.50 – 3.75	(e) 3.50 – 3.75
OKLAHOMA		
No. 1 P.W.	3.625 – 3.75	3.625 – 3.75
No. 1 straw	3.375 – 3.625	3.50 – 3.625
No. 2 straw	3.375 – 3.50	3.375 – 3.50
No. 2 dark	(h)3.375	(h)3.375
U.G.I. gas oil	(h)3.25	(h)3.25
No. 3 fuel	3.25 – 3.375	3.25 – 3.375
No. 5 fuel	(n)	(e)$0.65
No. 6 fuel	(h)$0.50	(h)$0.50
14-16 fuel	(e)$0.80	(e)$0.80
Range Oil	3.625 – 3.75	3.625 – 3.75
KANSAS (For Kans. destinations only).		
No. 1 p.w.	(e)3.875	(e)3.875
No. 6 fuel	(h) $0.55 –$0.60	(h) $0.55 –$0.60
N. TEX. REFINERS' QUOTATIONS (b)		
No. 1 P.W.		
E. TEX. REFINERS' QUOTATIONS		
No. 1 p.w.	(e)3.375	(e)3.375
N. LA. REFINERS' QUOTATIONS (For shipment to La. and Ark.)		
10-14 grav.	(e) $0.65 –$0.70	(e) $0.65 –$0.70
ARK. REFINER'S QUOTATIONS (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
No. 1	3.75	3.75
No. 2	3.50	3.50
28-32 zero fuel	3.375	3.375
Tractor Fuel	(j)4.50	(j)4.50

Prices Effective	Jan. 22	Jan. 15
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.75	$0.55 –$0.75
Light fuel	$0.75 –$0.85	$0.75 –$0.85
Diesel fuel (per gal.)	2.75 – 4.00	2.75 – 4.00
Stove dist. (per gal.)	3.00 – 5.00	3.00 – 5.00
Los Angeles:		
Heavy fuel	$0.55 –$0.75	$0.55 –$0.75
Light fuel	$0.70 –$0.85	$0.70 –$0.85
Diesel fuel (per gal.)	2.75 – 4.00	2.75 – 4.00
Stove dist. (per gal.)	2.75 – 5.00	2.75 – 5.00
San Francisco:		
Heavy fuel	$0.89	$0.89
Light fuel	$0.90	$0.90
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	5.50	5.50

Note: All above heavy fuels meet Pacific specification 490; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA. REFINERS' QUOTATIONS

Important Note: Penna. lube prices reported by refiners as for limited sale to regular customers only.

Viscous Neutrals No. 3 col. (*Viscosity at 70° F.*)		
200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	(e)34.50	(e)34.50
10 p.t.	(e)33.50	(e)33.50
15 p.t.	(e)32.50	(e)32.50
25 p.t.	31.00 –32.00	31.00 –34.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	(e)31.50	(e)31.50
10 p.t.	(e)30.50	(e)30.50
15 p.t.	(e)29.50	(e)29.50
25 p.t.	28.00 –30.00	28.00 –30.00

SOUTH TEXAS

Vis.	Color		
Pale Oils: (*Vis. at 100°F*)			
100	No. 1½-2½	5.75 – 6.00	5.75 – 6.00
200	No. 2-3	7.50 – 7.75	7.50 – 7.75
300	No. 2-3	8.00 – 8.25	8.00 – 8.25
500	No. 2½-3½	9.00 – 9.25	9.00 – 9.25
750	No. 3-4	9.50 – 9.75	9.50 – 9.75
1200	No. 3-4	9.875–10.50	9.875–10.50
2000	No. 4	10.00 –10.75	10.00 –10.75
Red Oils:			
200	No. 5-6	7.50 – 7.75	7.50 – 7.75
300	No. 5-6	8.00 – 8.25	8.00 – 8.25
500	No. 5-6	9.00 – 9.25	9.00 – 9.25
750	No. 5-6	9.50 – 9.75	9.50 – 9.75
1200	No. 5-6	9.875–10.50	9.875–10.50
2000	No. 5-6	10.00 –10.75	10.00 –10.75

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa)

Pale Oils:	(0 to 10 P.P.)		
Vis.	Color		
60-85	No. 2	6.50 – 7.50	6.50 – 7.50
86-110	No. 2	6.75 – 8.00	6.75 – 8.00
150	No. 3	12.25 –13.75	12.25 –13.75
180	No. 3	13.00 –14.00	13.00 –14.00
200	No. 3	13.50 –14.50	13.50 –14.50
250	No. 3	14.50 –16.00	14.50 –16.00
280	No. 3	15.50 –17.25	15.50 –17.25
300	No. 3	17.50 –17.75	17.50 –17.75
Red Oils:			
180	No. 5	(e)13.50	(e)13.50
200	No. 5	13.00 –14.00	13.00 –14.00
280	No. 5	14.75 –16.00	14.75 –16.00
300	No. 5	(h) 16.25–16.75	(h) 16.25–16.75

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

CHICAGO (Vis. at 100° F)

(e) Pale Oils 0 to 10 p.p.		
Vis.	Color	
60-85	No. 2	8.25	8.25
86-110	No. 2	8.50	8.50
150	No. 3	12.75	12.75
180	No. 3	14.00	14.00
200	No. 3	14.50	14.50
250	No. 3	15.50	15.50

Prices Effective	Jan. 22	Jan. 15
CHICAGO (Continued)		
(e) Red Oils:		
180—No. 5	13.50	13.50
200—No. 5	14.00	14.00
250—No. 5	14.50	14.50
280—No. 5	15.50	15.50
300—No. 5	17.25	17.25

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa)

Bright Stocks:		
190-200 Vis. at 210° D.	(e)29.00	(e)28.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	24.00 –25.00	24.00 –25.00
10 to 25 p.p.	23.00 –24.50	23.00 –24.50
25 to 40 p.p.	(h)24.00	(h)24.00
150-160 vis. at 210° E.	22.00 –24.00	22.00 –24.00
120 Vis. at 210° D:		
0 to 10 p.p.	22.75 –24.00	22.75 –24.00
25 to 40 p.p.	(e)22.50	(e)22.50
600 S.R. Dark Green	(e)8.00	(e)8.00
600 S.R. Olive Green	9.00 – 9.50	9.00 – 9.50
631 S.R.	(e)21.00	(e)21.00
Black Oil	(h) 4.00 –5.50	(h) 4.00 –5.50

(e) CHICAGO (Viscosity at 210°)

Unfiltered Steam Refined:		
140	10.00	10.00
160	11.00	11.00
200	12.00	12.00
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	24.75	24.75
15 to 25 p.p.	23.75	23.75
30 to 40 p.p.	23.25	23.25
E filtered Cyl. Stock	14.50	14.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

WESTERN PENNA. REFINERS' QUOTATIONS

Important Note: Penna. lube prices reported by refiners as for limited sale to regular customers only.

600 S.R. filterable	18.00 –19.00	18.00 –19.00
650 S.R.	20.00 –21.00	20.00 –21.00
600 fl.	21.00 –23.00	21.00 –23.00
630 fl.	24.00 –25.00	24.00 –25.00
Brt. stk, 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	(e)31.50	32.50 –36.00
15 p.t.	(e)30.50	31.50 –35.00
25 p.t.	29.00 –32.00	30.00 –34.00

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)		
Snow White	7.625 – 8.00	7.625 – 8.00
Lily White	6.625 – 7.00	6.625 – 7.00
Cream White	5.625 – 6.00	5.625 – 6.00
Light Amber	3.875 – 4.25	3.875 – 4.25
Amber	3.625 – 4.00	3.625 – 4.00
Red	3.50	3.50

Wax

WESTERN PENNA. REFINERS' QUOTATIONS

In bbls., carloads, N. Y.		
122-124 A.m.p., w.c. scale	(h) 5.50 –5.75	(h) 6.25 – 6.75
124-126 A.m.p., w.c. scale	5.50 – 6.25	6.25 – 6.875

OKLAHOMA Refiners' Quotations & Sales Prices. (In bbls. or burlap bags, carloads)

124-126 A.m.p., w.c. scale	(h)6.50	(h)6.75

CHICAGO QUOTATIONS (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)

Fully refined:		
122-124 (bags only)	6.10	6.10
125-127	6.10	6.10
127-129	6.35	6.35
130-132	6.65	6.65
132-134	6.90	6.90
135-137	7.65	7.65

(a) Prices FOB Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations: Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (e) One refiner quoting. (f) No quotations reported. (g) To resellers holding licenses. (h) Two refiners quoting. (j) For shipment to Ark. points only. (k) Two suppliers quoting. (l) Quotations. (m) Sales. (n) No quotations reported.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include* 1c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for March* 29, *April* 12, *April* 19 *and June* 7, 1939, *or write to N.P.N. These prices in effect Jan.* 22, 1940 *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
*Atlantic City, N. J.	7.6	8.7	4	8.1
*Newark, N. J.	7.6	8.7	4	8.1
Annapolis, Md.	8.35	9.35	5	9.50
Baltimore, Md.	7.75	8.75	5	8.5
Cumberland, Md.	9.15	10.15	5	10
Washington, D. C.	8.0	9	3	9.5
Danville, Va.	8.95	11.45	6	12.9
Norfolk, Va.	7.75	10.25	6	11
Petersburg, Va.	8.05	10.55	6	11.7
Richmond, Va.	8.05	10.55	6	10.7
Roanoke, Va.	9.25	11.75	6	11
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	9.85	6	11.2
Wheeling, W. Va.	8.85	10.75	6	12.2
Charlotte, N. C.	9.9	11.4	7	11.8
Hickory, N. C.	10.45	11.95	7	12.3
Mt. Airy, N. C.	10.3	11.8	7	12.2
Raleigh, N. C.	9.65	11.15	7	11.5
Salisbury, N. C.	9.95	11.45	7	11.9
Charleston, S. C.	7.75	10.25	7	10.6
Columbia, S. C.	8.6	11.1	7	11.5
Spartanburg, S. C.	9.3	11.8	7	12.2

Discount to undivided dealers on Esso: thru territory, except New Jersey points, which see in "Note" below: Dealer t.w. price less 0.5c per gal.

*Effective Sept. 14, 1939, S. O. New Jersey posted a minimum retail resale price of 11.9c thru New Jersey.

Note: While the above posted prices continue at Atlantic City and Newark, N. J., dealers will pay a net price of 8.6c per gal. for Esso. Dealers having pumps marked only, Esso, Esso Extra and "Standard" White gasoline will pay 8.1c per gal. for Esso.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

Socony Mobilgas
(*Regular Grade*)

	Consumer Tank Car	"Split" Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.7	9.2	*5	8.50
Borough of Richmond (Staten Is.)	7.7	9.2	*5	8.50
Albany, N. Y.	7.6	9.2	5	8.30
Binghamton, N. Y.	8.9	9.5	5	9.30
Buffalo, N. Y.	8.1	9.5	5	7.6
Jamestown, N. Y.	7.7	9.5	5	7.7
Plattsburg, N. Y.	8.1	10.6	5	8.90
Rochester, N. Y.	8.3	10	5	8.4
Syracuse, N. Y.	8.2	9.5	5	8.80
Bridgeport, Conn.	7.8	8.8	4	8.10
Danbury, Conn.	8.3	9.6	4	9.00
Hartford, Conn.	7.9	9.3	4	8.40
New Haven, Conn.	7.8	8.8	4	8.50
Bangor, Me.	7.9	10	5	8.40
Portland, Me.	7.6	9.4	5	8.50
Boston, Mass.	7.5	9	4	8.50
Concord, N. H.	8.4	10.7	5	9.10
Lancaster, N. H.	9.2	11.7	5	9.90
Manchester, N. H.	8.3	10.3	5	8.90
Providence, R. I.	7.5	9.3	5	8.50
Burlington, Vt.	8.1	10.0	5	8.70
Rutland, Vt.	8.5	10.5	5	8.90

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Atlantic Refining

Atlantic White Flash Gasoline
(*Regular Grade*)

	Commercial Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Philadelphia, Pa.	7.5	9	5	10
Pittsburgh	8	9.5	5	10.5
Allentown	8	9.5	5	10.5
Erie	8	9.5	5	10
Scranton	7.5	10	5	10.5
Altoona	8	10	5	10.5
Emporium	8	10	5	10.5
Indiana	8	10	5	10.5
Uniontown	8	10	5	10.5
Harrisburg	8	9.5	5	10.5
Williamsport	8.5	10	5	10.5
Dover, Del.	...	8.5	5	10.5
Wilmington	...	9	5	9.75
Boston, Mass.	...	9	4	8.5
Springfield, Mass.	...	9	4	9.0
Worcester, Mass.	...	9.5	4	8.4
Fall River, Mass.	...	8.5	4	8.5
Hartford, Conn.	...	9.3	4	8.5
New Haven, Conn.	...	8.8	1	8.5
Providence, R. I.	...	9.3	4	8.5
Atlantic City, N. J.	...	8.6	4	8.1
Camden, N. J.	...	8.6	4	8.1
Trenton, N. J.	...	8.6	4	8.1
Annapolis, Md.	...	9.35	5	9.5
Baltimore, Md.	...	8.75	5	8.5
Hagerstown, Md.	...	9.85	5	10
Richmond, Va.	...	10.55	6	10.7
Wilmington, N. C.	...	10.35	7	10.8
Brunswick, Ga.	...	10	7	*11
Jacksonville, Fla.	...	9	8	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal. except in Georgia and Florida, dealer t.w. and undivided dealer price is same.

Discounts: At Scranton, Pa., 1c per gal. voluntary discount allowed to dealers only, effective July 8, 1939.

Kerosine discount: Thru Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time, effective since Oct. 29, 1936.

S. O. Ohio

Sohio X-70 Gasoline
(Regular Grade)

	Consumer T.W.	†Divided Dlr.	‡S.S.	Gaso-line Taxes	Kero-sine T.W.
Ohio, Statewide	11	10	13	5	*12
Akron	11	9	11	5	*8.5
Cincinnati	11	9.5	12	5	*12
Cleveland	11	9	11.5	5	*12
Columbus	11	9.5	12	5	*12
Dayton	11	9.5	12	5	*12
Marietta	11	9.5	12	5	*12
Portsmouth	11	10	13	5	*12
Toledo	11	9	11.5	5	*12
Youngstown	11	9.5	12	5	*11.5

Renown Gasoline
(Third Grade)

Ohio, Statewide	11	10	13	5	....
Akron	11	9	11	5	....
Cincinnati	11	9.5	12	5	....
Cleveland	11	9	11.5	5	....
Columbus	11	9.5	12	5	....
Dayton	11	9.5	12	5	....
Marietta	11	9.5	12	5	....
Portsmouth	11	10	13	5	....
Toledo	11	9	11.5	5	....
Youngstown	11	9.5	12	5	....

Note: Prices at other Ohio points may be obtained by writing NPN.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

†This price also to authorized agents, exclusive of 0.5c rental.

‡Prices are at company-operated service stations.

Discount to undivided dealers: 0.5c less than divided dealer t.w.

S. O. Kentucky

Crown Gasoline
(*Regular Grade*)

	Consumer T.W.	Net Dlr.	Gaso-line Taxes	Kero-sine T.W.
Covington, Ky.	12	9	6	9.5
Lexington, Ky.	13.5	10.5	6	10
Louisville, Ky.	12.5	9.5	6	9
Paducah, Ky.	12.5	9.5	6	9
Jackson, Miss.	12.5	9.5	7	*9.5
Vicksburg, Miss.	12.5	9.5	7	*9
Birmingham, Ala.	13.5	10.5	*8	9
Mobile, Ala.	10.5	7.5	*9	8
Mongtomery, Ala.	13.5	10.5	*9	*10
Atlanta, Ga.	14	11	7	*7
Augusta, Ga.	13.5	10.5	7	*9
Macon, Ga.	12.5	9.5	7	*9.5
Savannah, Ga.	12.5	9.5	7	*8
Jacksonville, Fla.	12	9	8	8
Miami, Fla.	12	9	8	7
Pensacola, Fla.	12.5	9.5	*9	8.5
Tampa, Fla.	13	10	8	8.5

Kyso Gasoline
(Third Grade)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	12	9.5	6	....
Louisville, Ky.	10	7.5	6	....
Paducah, Ky.	10.5	8	6	....
Jackson, Miss.	11	8.5	7	....
Vicksburg, Miss.	11	8.5	7	....
Birmingham, Ala.	10.5	8	*8	....
Mobile, Ala.	8.5	6	*9	....
Montgomery, Ala.	11.5	9	*9	....
Atlanta, Ga.	10	7.5	7	....
Augusta, Ga.	12	9.5	7	....
Macon, Ga.	11	8.5	7	....
Savannah, Ga.	10.5	8	7	....
Jacksonville, Fla.	8	8	8	....
Miami, Fla.	10.5	8	8	....
Pensacola, Fla.	10.5	8	*9	....
Tampa, Fla.	11.5	9	8	....

Discounts to all tank wagon consumers at Tampa and St. Petersburg, Fla.: on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month.

**Taxes*: In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have kerosine taxes of 1c per gal., and Mississippi 0.5c, not included in above prices.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)
Red Dealer Prices

	Crown Cons. T.W.	Red Crown	Stano-lind	Gaso-line Taxes	Kero-sine T.W.
Chicago, Ill.	11.1	9.1	6.9	4	10
Decatur, Ill.	11.1	8.1	6	4	8.5
Joliet, Ill.	11.1	9.6	7.4	4	10
Peoria, Ill.	11.1	8.7	8.1	4	10
Quincy, Ill.	10.9	9.4	8.5	4	9.8
Indianapolis, Ind.	11.8	9.3	8.4	5	*10
Evansville, Ind.	11.6	10.1	9.4	5	*10.5
South Bend, Ind.	11.8	10.3	7.3	5	*10
Detroit, Mich.	9.6	8.1	7.6	4	7.6
Grand Rapids, Mich.	9.9	7.7	7.2	4	9.7
Saginaw, Mich.	10.8	9.3	8.6	4	9.3
Green Bay, Wis.	11.9	10.4	9.9	5	10
Milwaukee, Wis.	11.3	9.8	9.3	5	10.2
La Crosse, Wis.	11.5	10	9.5	5	10.4
Minneapolis-St. Paul	11.5	9.5	9	5	10.4
Duluth, Minn.	11.9	10.4	9.9	5	10.8
Mankato, Minn.	11.5	10	9.5	5	10.4
Des Moines, Ia.	10.9	8.4	7.4	4	*9.8
Davenport, Ia.	11.1	9.6	7.5	4	*10
Mason City, Ia.	11.3	9.8	6.9	4	*10.2
St. Louis, Mo.	10.7	9.2	7.5	*4	8
Kansas City, Mo.	10.4	8.9	6.9	*4	8
St. Joseph, Mo.	10.4	8.0	7.5	*4	7.9
Fargo, N. D.	12.7	11.2	10.7	5	11.6
Huron, S. D.	12	10.5	10	5	10.9
Wichita, Kans.	9.3	7.1	5.5	4	7

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Kerosine taxes: Indiana has 4c, Iowa 3c per gal. state tax, not included in above prices.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W.	Dealer	Gaso-line Taxes	Kero-sine T.W.
Omaha, Neb.	10.5	7.5	6	9.8
McCook	10.5	7.9	6	9
Norfolk	10.5	8.4	6	9.5
North Platte	11.8	8.9	6	10
Scottsbluff	12.5	9.5	6	11.4

S. O. Louisiana

Esso
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Little Rock, Ark.	7.75	10.25	7.5	10
Alexandria, La.	7.25	9.75	8	*11.5
Baton Rouge, La.	7.25	9.75	8	*9.5
New Orleans, La.	7.25	9.75	8	*9
Lake Charles, La.	7.25	9.75	8	*11.5
Shreveport, La.	6	8.5	8	*10
Lafayette, La.	7.5	10	8	*10
Bristol, Tenn.	10.25	9.75	8	13
Chattanooga, Tenn.	9.5	12	8	12
Knoxville, Tenn.	10	12.5	8	13
Memphis, Tenn.	8	10.5	8	11
Nashville, Tenn.	9	9.5	8	11

*Taxes: Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, none of which are included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Above prices include these inspection fees on both gasoline and kerosine unless otherwise specified, per gallon, figured on basis of 50 gallons per barrel:
Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1.5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1.8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1.50c, (3.50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. lots of more than 50, in bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1.8c; South Dakota, 1/10c; Tennessee, 2.5c; and Wisconsin, 3/100c.
Kerosine inspection fee only: Iowa, 3.50c; Michigan, 1.5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for March 29, April 12, April 19 and June 7, 1939, or write to N.P.N. These prices in effect Jan. 22, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

Humble Oil & Refining Co.

Humble Motor Fuel
(*Regular Grade*)

	*T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Dallas, Tex	7	11	5	7
Ft. Worth, Tex	7	11	5	7
Houston, Tex	9	13	5	8
San Antonio, Tex	8	12	5	8

Thriftane
(Leaded, 67 Octane, Purple Gasoline)

Dallas	5.5	9	5
Ft. Worth	5.5	9	5
Houston	7.5	11	5
San Antonio	6	10	5

*These tank wagon prices apply to all classes of dealers and consumers.

Continental Oil

Conoco Bronz-z-z (Regular Grade)

	††T.W.	Dealer	Gasoline Taxes	Kerosine ‡T.W.
Denver, Col	10.5		5	11.5
Grand Junction, Col	12.5		5	15
Pueblo, Col	10		5	9
Casper, Wyo	12.5		5	11.5
Cheyenne, Wyo	10.5		5	13
Billings, Mont	12.5		6	13
Butte, Mont	14		6	15.5
Great Falls, Mont	13.5		6	15.5
Helena, Mont	14.5		6	15.5
Salt Lake City, Utah	10.5	10.5	5	16
Boise, Ida	**15.1	**15.1	6	18
Twin Falls, Ida	**15.1	**15.1	6	18
Albuquerque, N. M	10.5	10.5	†6.5	10
Roswell, N. M	9.5	9.5	†6.5	8
Santa Fe, N. M	10.5	10.5	*7	10
Ft. Smith, Ark	9.5		5	7.5
Little Rock, Ark	9.75		7.5	8
Texarkana, Ark	8		5	7
Muskogee, Okla	8	7	5	7
Oklahoma City, Okla	6		5	6.5
Tulsa, Okla	6		5	7

Demand Gasoline
(Third Grade)

Denver, Col	9.5		5	....
Grand Junction, Col	11.5		5	....
Pueblo, Col	9		5	....
Casper, Wyo	11.5		5	....
Cheyenne, Wyo	9.5		5	....
Billings, Mont	11.5		6	....
Butte, Mont	11		6	....
Great Falls, Mont	11.5		6	....
Helena, Mont	13.5		6	....
Salt Lake City, Utah	9.5	9.5	5	....
Boise, Ida	**14.1	**14.1	6	....
Twin Falls, Ida	**14.1	**14.1	6	....
Albuquerque, N. M	8.5	8.5	†6.5	....
Roswell, N. M	8.5	8.5	†6.5	....
Santa Fe, N. M	9.5	9.5	*7	....
Ft. Smith, Ark	7	..	5	....
Little Rock, Ark	7.5	..	7.5	....
Texarkana, Ark	6	..	5	....
Muskogee, Okla	7	6	5	....
Oklahoma City, Okla	5.5	..	5	....
Tulsa, Okla	5	..	5	....

†Includes city tax of 0.5c.
*Includes 1c city tax.
‡Prices are in t.w. deliveries to consumers and dealers.
**Prices include 0.1c to cover 1-mill tax for toll bridges.
††T.w. prices represent prices to consumer; also to dealers at points where no dealer prices are shown.

S. O. California

Standard Gasoline
(*Regular Grade*)

	T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal	13.5	14.5	4	11.5
Los Angeles, Cal	13	14	4	10
Fresno, Cal	14.5	15.5	4	12.5
Phoenix, Ariz	14	15	6	*12.5
Reno, Nev	15.5	16.5	5	13.5
Portland, Ore	14	15	6	13.5
Seattle, Wash	14	15	6	†13.5
Spokane, Wash	15.5	16.5	6	†16.5
Tacoma, Wash	14	15	6	†13.5

Flight Gasoline
(*Third Grade*)

San Francisco, Cal	12	13	4	....
Los Angeles, Cal	11.5	12.5	4	....
Fresno, Cal	13	14	4	....
Reno, Nev	14	15	5	....
Phoenix, Ariz	11	12	6	....
Portland, Ore	12.5	13.5	6	....
Seattle, Wash	12.5	13.5	6	....
Spokane, Wash	13	14	6	....
Tacoma, Wash	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal. not included in above prices.

†Washington has 0.25c per gal. tax on kerosine sales not included in above prices.

Discount to 100% dealers, thru territory, off posted t.w. prices, on gasolines: on Standard Ethyl, Standard Gasoline and Stanavo Aviation, 3c per gal.; on Flight gasoline, 2c.

Canada

PRICES OF IMPERIAL OIL LTD.
Per Imperial Gallon, which is 1.2 U. S. Gallons
3-Star Imperial Gasoline
(*Regular Grade*)

	T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont	15.5	8	16
Toronto, Ont	15.5	8	16
Brandon, Man	21	7	22
Winnipeg, Man	19.5	7	20.5
Regina, Sask	18.5	7	20.5
Saskatoon, Sask	21	7	23
Edmonton, Alta	18.9	7	20.9
Calgary, Alta	16	7	18
Vancouver, B. C	16	7	23
Montreal, Que	15.5	8	16
St. John, N. B	14.5	10	18.5
Halifax, N. S	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car, tank wagon or dealer prices, as indicated, of aviation gasoline in several marketing territories.

S. O. OHIO
Thru Ohio
Esso Aviation

	Consumer T.W.	Gasoline Taxes
74 octane	16	5
80 octane	17	5
87 octane	18	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Aviation Gasoline
73 Octane Number

Chicago, Ill	14.9	
Detroit, Mich	16.5	4
Milwaukee, Wis	15.1	5
Minneapolis, Minn	15.3	5
St. Louis, Mo	14.5	3
Kansas City, Mo	14.2	*4
Fargo, N. D	16.5	5
Huron, S. D	15.8	5

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.
74 Octane Aviation Gasoline, Clear

	Tank Car
FOB Baytown, Tex	8.5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	T.W. & Dealer Price	Gasoline Taxes
Denver, Colo	15	5
Cheyenne, Wyo	15.5	5
Helena, Mont	22.5	6
Salt Lake City, Utah	18	5
Albuquerque, N. M	14	*6.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz	17.5	6
Los Angeles, Cal	15	4
San Francisco, Cal	15.5	4
Reno, Nev	17.5	5
Portland, Ore	16	6
Seattle, Wash	16	6
Spokane, Wash	19	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

	Posted Tank Wagon Prices Mineral Spirits	V.M.&P.
Newark, N. J	11.5	15.5
Baltimore, Md	15.5	....
Washington, D. C	15	....

Discounts: Buyers taking following quantities at one time, get these discounts. Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y	11.5	12.5
*New York City	9.5	10.5
Rochester, N. Y	12.5	12.5
Syracuse, N. Y	12.5	15
Boston, Mass	11.5	11.5
Bridgeport, Conn	11.5	12
Hartford, Conn	11	11.5
Providence, R. I	11.5	12.5

*Prices apply to consumers only in quantities over 1,000 gals. annually. For quantities under 1,000 gals. annually, add 0.5c per gal.

ATLANTIC REFINING CO.

Philadelphia, Pa	12	14.5
Lancaster, Pa	13.5	16
Pittsburgh, Pa	14.5	14.5

Note: Prices for Mineral Spirits also apply to Stod'dard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

Discounts: Philadelphia, 200 gals. or more at one time, 2c per gal. less. Lancaster, contract buyers taking 1,000 gals. or more per year, one drum up, 2c per gal. less; non-contract buyers, 200 gals. or more at one time, 2c per gal. less. Pittsburgh, 500 gals. or more at one time, 2c.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13

Note: V.M.&P. naphtha prices also apply on Dry Cleaners naphtha, special Varnolene, Varnolene and Sohio Solvent. Discounts to contract consumers off t.w. price; 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA
(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill	16.7	17	16.4
Detroit, Mich	19.7	18.7	20.2
Kansas City, Mo	14.4	15.4	14.9
St. Louis, Mo	14.7	15.7	13.4
Milwaukee, Wis	19.3	20.3	19.8
Minneapolis, Minn	19.5	20.5	18.2

Note: All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50	8.50
New York Harbor	9-9.5	8.75-9
Philadelphia district	10	8.25-9
Boston	9.5	9.5
Providence	9.5	9.5
†Ohio points, delivered	8.75	*8.25

*This is on rubber solvent.
†Ohio prices are those of S. O. Ohio. Its prices for D.C. naphtha, special Varnolene, Varnolene and Sohio Solvent are same as for V.M.&P.

Price Changes

Dates and amounts of changes. See table for full current prices.

Socony-Vacuum Oil—Kerosine:

Correction: New Haven t. w. up 1.4c, Dec. 19, instead of up 0.4c as published on page 22 of Dec. 27, 1939 issue.

S. O. Ohio—X-70 Gasoline:

Correction: Akron s. s. price should have been 11c instead of 13c since Oct. 7.

S. O. Indiana—Red Crown and Stanolind Gasoline:

Minneapolis-St. Paul dealer prices cut 0.5c, Jan. 5.

Kerosine:

Wichita t. w. cut 0.9c, Jan. 11.

Tanker Rates

(Approximate freight rates. To Continental ports, shillings per ton of 2240 lbs., British sterling: to U. S. ports cents per bbl.)

	Crude & /or Fuel		Refined Oil & / or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.(k)	(q)	(q)	(q)	(q)
Aruba-U.K./Cont.	(q)	(q)	(q)	(q)
Gulf-N. Atlantic(l) (not E. of N.Y.): Hvy. Crude & fuel, (10 to 19.9 gravity)	60c	60 to 62c	....	....
Light Crude, (30 Grav. or Lighter)	53c	54 to 56c	....	....
Gasoline	....	....	66c	66 to 68c
Kerosine	....	....	69c	69 to 71c
Light Fuel	....	....	72c	72 to 74c

Coming Meetings

Tennessee Oil Men's Assn., First Annual Exposition Meeting, Peabody Hotel, Memphis, Tenn., Jan. 28-30.

American Road Builders, Exposition, International Amphitheatre, Stevens Hotel, Chicago, Ill., Jan. 29-Feb. 2.

South Dakota Independent Oil Men's Assn., annual convention, Mitchell, South Dakota, Feb. 6, 7.

American Institute of Mining and Metallurgical Engineers, New York, Feb. 12 to 15.

Kentucky Petroleum Marketers Assn., 14th annual meeting and convention, Brown Hotel, Louisville, Ky., Feb. 14, 15.

Assn. of Highway Officials of North Atlantic States, Hotel Ambassador, Atlantic City, N. J., Feb. 14-16.

Missouri Independent Oil Jobbers Assn., Annual Convention, Elms Hotel, Excelsior Springs, Mo., Feb. 21 and 22.

National Dixie Distributors, Milwaukee, Wis., Feb. 21, 22.

Wisconsin Petroleum Assn., annual meeting and equipment show, Schroeder Hotel, Milwaukee, Feb. 21, 22, 23.

Ohio Petroleum Marketers Assn., Deshler-Wallick Hotel, Columbus, O., Feb. 27, 28 and 29.

Illinois Petroleum Marketers Assn., annual convention, Hotel Pere Marquette, Peoria, Ill., Feb. 27-29.

Iowa Independent Oil Jobbers' Assn., annual meeting, Hotel Fort Des Moines, Des Moines, March 5-7.

Indiana Independent Petroleum Assn., Spring Convention, Hotel Severin, Indianapolis, Ind., March 6, 7.

American Society for Testing Materials, Statler Hotel, Detroit, Mich., March 4-8.

American Petroleum Institute, Mid-Continent District, Division of Production, Wichita, Kan., March 14, 15.

Society of Automotive Engineers, National Aeronautic Meeting, Washington Hotel, Washington, D. C., March 14-15.

American Petroleum Institute, Pacific Coast District, Los Angeles, Calif., March 19.

Oil Trades Assn. of New York, Annual Meeting, Waldorf Astoria Hotel, New York, N. Y., March 21.

American Petroleum Institute, Southwestern District, Division of Production, Houston, Tex., March 28, 29.

Western Petroleum Refiners Assn., Annual Meeting, Allis Hotel, Wichita, Kans., Mar. 31, Apr. 1, 2.

Society of Automotive Engineers, National Transportation & Maintenance Meeting, Mellon Institute Auditorium, Pittsburgh, Pa., March 28-29.

American Chemical Society, Cincinnati, Ohio, April 8-12.

American Assn. of Petroleum Geologists, Stevens Hotel, Chicago, April 10, 11, 12.

American Petroleum Institute, Eastern District, Division of Production, Columbus, O., April 11, 12.

National Petroleum Assn., 37th semi-annual meeting, Hotel Cleveland, Cleveland, O., April 18, 19.

American Institute of Mining & Metallurgical Engineers, Open Hearth Conference, Pittsburgh, Pa., April 24-26.

Pennsylvania State College, 9th Petroleum and Natural Gas Conference, State College, Pa., April 26-27.

Petroleum Industry Electrical Assn., Dallas, Tex., May 1 to 3.

American Institute of Chemical Engineers 32nd Semi-Annual Meeting, Statler Hotel, Buffalo, N. Y., May 13, 14 and 15.

Natural Gasoline Assn. of America, 19th annual convention, Hotel Tulsa, Tulsa, May 15, 16, 17.

International Petroleum Exposition and Congress, Tulsa, May 18-25.

American Petroleum Institute, 10th Mid-Year Meeting, Blackstone & Texas Hotels, Fort Worth, Tex., May 27-31.

Society of Automotive Engineers, Summer Meeting, The Greenbrier, White Sulphur Springs, W. Va., June 9-14.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 24-28.

National Safety Congress & Exposition, Hotel Stevens, Chicago, Ill., Oct. 7-11.

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline-Kerosine Oil		Distillate-Gas Oil-Fuel Oil	
	Cents per Cwt.	Cents per gal. 6.6 lbs.	Cents per Cwt.	Cents per gal. 7.4 lbs.
Chicago, Ill	40	2.640	32	2.368
Decatur, Ill	39	2.574	31	2.294
Joliet, Ill	40	2.640	32	2.368
Peoria, Ill	39	2.574	31	2.294
Quincy, Ill	36	2.376	29	2.146
Indianapolis, Ind	48	3.168	39	2.886
Evansville, Ind	46	3.036	37	2.738
South Bend, Ind	49	3.234	**12	**3.108
Detroit, Mich	64	4.224	51	3.774
Gd. Rapids, Mich.	61	4.026	50	3.700
Saginaw, Mich	66	4.356	53	3.922
Green Bay, Wis	51	3.366	41	3.034
Milwaukee, Wis	43	2.838	34.5	2.553
LaCrosse, Wis	46	3.036	37	2.738
Min'ap'l's-St. Paul	46	3.036	37	2.738
Duluth, Minn	52	3.432	41.5	3.071
Mankato, Minn	46	3.036	37	2.738
Des Moines, Ia	36	2.376	29	2.146
Davenport, Ia	39	2.574	31	2.294
Mason City, Ia	42	2.772	33.5	2.479
St. Louis, Mo	33	2.178	26.5	1.961
Kansas City, Mo.	28	1.848	22.5	1.665
St. Joseph, Mo.	28	1.848	22.5	1.665
Fargo, N. D.	63	4.158	50.5	3.737
Minot, N. D.	83	5.478	66.5	4.921
Huron, S. D.	53	3.498	42.5	3.145
Wichita				
From Ponca City	7.5	*0.495	7.5	†0.555
From Tulsa	12.5	*0.825	12.5	†0.925
From Cushing	11	*0.726	11	†0.814

*This rate also includes distillate rate at 6.6 lbs. per gal.

**This rate applies only to residual fuel and gas oil. Combination rate of 32c per cwt. at 7.4, Group 3 to Chicago, plus 9c per cwt. at 6.6, Chicago to South Bend, total of 2.962c per gal., applies to petroleum fuel oil distillate not suitable for illuminating purposes.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

Retail Posted Gasoline Prices At Service Stations in 50 Cities

	Net Dealer Price	Indicated Dealer Margin	Total "Gas" Tax*	Apparent Prevlg. Posted Retail Price Incl. Tax
Portland, Me.	8.9	3.6	5.0	17.5
Manchester,	9.8	3.7	5.0	18.5
Burlington, Vt.	9.5	3.0	5.0	17.5
Boston	8.5	3.0	4.0	15.5
Providence	8.8	2.2	4.0	15.0
Hartford	8.8	3.0	4.0	15.8
Buffalo	9.0	3.4	5.0	17.4
New York	8.7	3.8	5.0	17.5
Newark	8.1	3.8	4.0	15.9
Philadelphia	8.5	2.5	5.0	16.0
Dover, Del.	8.0	2.0	5.0	15.0
Baltimore	8.25	4.55	5.0	17.8
Washington	8.5	4.0	3.0	15.5
Charleston, W. Va.	10.55	4.05	6.0	20.6
Norfolk, Va.	9.75	4.55	6.0	20.3
Charlotte, N. C.	10.9	3.8	7.0	21.7
Charleston, S. C.	9.25	3.75	7.0	20.0
Atlanta	11.0	4.0	7.0	22.0
Jacksonville	9.0	3.0	8.0	20.0
Birmingham	10.5	4.0	8.0*	22.5
Vicksburg	9.5	5.0	7.0	21.5
Memphis	10.0	4.8	8.0	22.8
Lexington	10.5	4.0	6.0	20.5
Youngstown, O.	9.0	3.0	5.0	17.0
South Bend	10.3	4.2	5.0	19.5
Chicago	9.1	2.32	4.0	15.42
Detroit	8.1	3.2	4.0	15.3
Milwaukee	9.8	4.1	5.0	18.9
St. Paul-Minneapolis	10.0	4.0	5.0	19.0
Fargo, N. D.	11.2	3.5	5.0	19.7
Huron, S. D.	10.5	4.2	5.0	19.7
Omaha	7.5	3.0	6.0	16.5
Des Moines	8.4	3.5	4.0	15.9
St. Louis	9.2	3.5	4.0*	16.7
Wichita	7.1	2.8	4.0	13.9
Tulsa	6.0	4.0	5.0	15.0
Little Rock	9.75	4.25	7.5	21.5
New Orleans	9.25	4.0	8.0	21.25
Houston	9.0	4.5	5.0	18.5
Albuquerque	10.5	4.5	6.5†	21.5
Denver	10.5	4.5	5.0	20.0
Casper, Wyo.	12.5	5.0	5.0	22.5
Butte, Mont.	14.0	4.0	6.0	24.0
Boise, Idaho	15.0	4.0	6.1	25.1
Salt Lake City	10.5	4.0	5.0	19.5
Reno, Nev.	12.5	4.0	5.0	21.5
Phoenix, Ariz.	11.0	4.0	6.0	21.0
San Francisco	10.5	4.0	4.0	18.5
Portland, Oreg.	11.0	4.0	6.0	21.0
Spokane, Wash.	12.5	4.0	6.0	22.5
Average 50 Cities	9.78	3.75	5.42	18.95

*Includes 1c city tax. †Includes 0.5c city tax.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect Jan. 22, 1940

Following are posted tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

S. O. NEW JERSEY

	No. 1	No. 2	No. 4
Atlantic City, N. J.	8.1	7.1	7.1
Newark	8.1	7.1	7.1
Annapolis, Md		7.00	
Baltimore	7.50	7.00	6.50
Washington, D. C.	7.75	7.25	7.25
Norfolk, Va.	7.75	6.75	6.75
Petersburg	8	7	
Richmond	8	7	7
Charlotte, N. C.	9.25	8	
Hickory		8.25	
Raleigh	9.25	7.75	
Charleston, S. C.	8.25	6.75	
Columbia	9.25	7.75	
Spartanburg	9.95	8.45	

SOCONY-VACUUM OIL CO. INC.
(S. O. New York Division)

	Nos. 2 & 3	No. 4
New York City	7.00	7.00
Albany, N. Y.	7.20	6.70
Rochester, N. Y.	7.50	7.50
Boston, Mass.	7.20	7.20
Bangor, Me.	7.60	7.60
Manchester, N. H.	7.00	7.00
Burlington, Vt.	7.90	7.90
Hartford, Conn.	7.30	7.30
New Haven, Conn.	7.20	7.20
Providence, R. I.	7.20	7.20

Note: Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

ATLANTIC REFINING

	Numbers 1	2	3	4	5	6
Phila., Pa.	8	7.00	7.00	7.00	4.25	3.50
Allentown, Pa.	8.5	7.00	7.00	7.00	....	....
Wilmington, Del.	7.75	7.00	7.00	7.00	....	....
Springfield, Mass.	9.0	7.7	....	....	....	....
Worcester, Mass.	8.4	7.5	....	7.5	....	....
Hartford, Conn.	8.5	7.3	....	7.3	....	....

S. O. OHIO

	No. 1	No. 2	No. 3
Columbus Division and Cleveland	7.50	7.50	7.00
City of Lima	8.00	8.00	7.00
Rest of Ohio	8.00	8.00	7.50

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

S. O. INDIANA
Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	(a)6.75	6.75
Indianapolis	....	(b)7.8
Detroit	....	6.6
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	(c)6.7
Kansas City	6.8	6.8

(a) For 400 gals. and over; 150 to 399 gals., 7.25c; 1 to 149 gals., 8.25c.

(b) Excluding 4c state tax.

(c) For 400 gals. & over; 100 to 399 gals., 7c; 1 to 99 gals., 8c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Atlantic Coast Refiners' & Tanker Terminal Operators' Quotations (FOB Refineries & Terminals)

MOTOR GASOLINE—Prices Effective Jan. 22

District:	60-64 Oct.,	65 Oct.	65 Oct. & Above	68-70 Oct.	72-74 Oct.
N. Y. harbor	(m)6.70	(r) 6.50 – 7.30	6.50 – 7.00	(r) 6.50 –6.75	6.50 – 7.70
(a) N. Y. harbor	(m)6.70	(r) 6.40 – 7.05	6.40 – 6.75	(r) 6.40 –6.50	6.40 – 7.20
Albany	.....	.....	.....	.....	7.60 – 7.80
Philadelphia	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 8.00
Baltimore	6.25 – 6.75	6.50 – 7.00	6.50 – 7.00	6.50 – 6.75	6.50 – 7.75
Norfolk	(r) 6.625–6.875	(r)7.00	(r)7.00	(r) 6.75 –7.00	7.00 – 7.75
Wilm'ton	6.50 –6.875	(r)7.00	(r)7.00	(r) 6.75 –7.00	7.00 – 7.85
Char'ston	6.625–6.875	(r)6.75 –7.00	(r)7.00	(r)7.00	7.00 – 7.55
Savannah	6.25 – 6.875	(r)6.75 –7.00	6.75 – 7.00	(r) 6.75 –7.00	7.00 – 7.25
Jacksonville	6.25 – 6.875	(r)6.75 –7.00	(r) 6.75 –7.00	(m)6.75	7.00 – 7.25
Miami	(r) 6.25 –6.875	(m)7.00	(m)7.00	(o)	(m)7.00 –7.25
Tampa	(r) 6.25 –6.875	(m)7.00	(m)7.00	(o)	7.00 – 7.25
Pensacola	(m)6.625–6.875	.....	.....	(o)	(m)7.00 –7.25
Mobile	6.00 – 6.50	(m)6.50	(m)6.50	(o)	6.75 – 7.00
Portland	.....	(m)7.50	(r)7.50	.....	7.50 – 7.60
Boston	6.50 – 7.25	6.75 – 7.15	6.75 – 7.15	(r) 6.75 –7.00	6.75 – 7.50
Providence	6.80 – 7.25	(r)7.00 –7.15	7.00 – 7.15	(m)7.00	7.00 – 7.50

FUEL OILS—Prices Effective Jan. 22

	Nos. 2-3	No. 4	No. 5	No. 6
N. Y. Harb.	5.10 – 5.60	5.10 – 5.60	$1.70 –$1.80	(u)$1.50
N. Y. Harb., barges	5.00 – 5.50	5.00 – 5.50	.....	.....
Albany	5.20	5.20	(m)$2.00	(m)$1.70
Philadelphia	4.75 – 5.60	4.50 – 5.35	$1.46 –$1.80	(u) $1.25–$1.50
Baltimore	4.75 – 5.50	(r) 4.50 –5.25	(r) $1.47–$1.70	(u) $1.25–$1.50
Norfolk	5.00 – 5.50	(m)5.50	.....	(u)$1.50
Charleston	(r) 5.00 –5.50	.....	.....	.....
Savannah	(m)5.00	.....	.....	(r)$1.45
Jacksonville	.....	.....	.....	(u)$1.45
Tampa	.....	.....	.....	(u)$1.40
Portland	5.40 – 5.80	(m)5.40 –5.80	(m)$2.00	(r)$1.50
Boston	5.20 – 5.70	5.20 – 5.70	(r) $1.70–$1.80	(u)$1.50
Providence	5.20 – 5.70	5.20 – 5.70	$1.75 –$1.80	(u)$1.50

District:	(c) Bunker C Fuel	(c) Diesel Oil
N. Y. harbor	(r)$1.50	$2.10 –$2.20
Philadelphia	$1.25 –$1.50	$2.10 –$2.20
Baltimore	(m)$1.50	$2.10
Norfolk	(m)$1.50	$2.10 –$2.20
Charleston	.....	$1.90 –$2.20
Savannah	(m)$1.45	$1.995
Jacksonville	(m)$1.45	$1.995–$2.10
Tampa	(m)$1.40	$1.995–$2.10
Portland	(m)$1.50	$2.20
Boston	(m)$1.50	$2.10 –$2.20
Providence	(m)$1.50	$2.10 –$2.20

District:	Diesel Oil Shore Plants	Gas House Gas Oil 28-34 Gravity
N. Y. harbor	5.10	5.20
Albany	5.20	....
Philadelphia	5.00	....
Baltimore	5.00	5.00
Norfolk	5.00	5.00
Charleston	5.00	....
Jacksonville	4.75	....
Tampa	4.75	....
Portland	5.40	5.50
Boston	5.20	5.30
Providence	5.20	5.30

KEROSINE and or NO. 1 FUEL:

District:			
N. Y. harbor	5.60 –6.00	Jacksonville	5.25-5.50
(a) N. Y. harb.	5.50 –5.90	Miami	(r)5.25-5.375
Albany	5.70	Tampa	5.25-5.50
Phila	5.25 –6.00	Pensacola	(m)5.25-5.375
Baltimore	5.25 –6.00	Mobile	(r)5.125-5.375
Norfolk	5.50 –6.00	Portland	5.90 -6.20
Wilm'ton, N.C.	5.50 –6.00	Boston	5.70 -6.10
Charleston	5.50 –6.00	Providence	5.70 -6.10
Savannah	5.25 –5.625		

Pacific Export

(e) (Quotations at seaboard, Los Angeles, cargo lots cents per gal., except where otherwise noted.)

Prices Effective	Jan. 22	Jan. 15
U. S. Motor, under 65 octane	5.75 – 6.00	5.75 – 6.00
400 e.p. blend, 65 oct. min.	6.00 – 6.25	6.00 – 6.25
390 e.p. blend, 66 oct.	6.125– 6.375	6.125– 6.375
390 e.p. blend, 68 oct.	6.25 – 6.50	6.25 – 6.50
375 e.p. blend, 70 oct.	6.375– 6.75	6.375– 6.75
(d) 38-40 gravity, w.w. kerosine	4.25 – 5.00	4.25 – 5.00
41-43 grav., w.w. kero.	4.50 – 5.00	4.50 – 5.00
44 grav., w.w. kero	5.00 – 5.50	5.00 – 5.50
Cargo lots, per bbl.		
Diesel fuel, 24 & above	$1.25 –$1.35	$1.25 –$1.35
Diesel fuel, under 24	$1.15 –$1.25	$1.15 –$1.25
(f) 30-34 grav., diesel (gas oil)	$1.25 –$1.35	$1.25 –$1.35
(g) Grade C fuel	$0.68 –$0.73	$0.68 –$0.73

Prices Effective	Jan. 22	Jan. 15
In Ships' Bunkers, or deep tank lots, per bbl.:		
(f) Diesel fuel	$1.35 –$1.45	$1.35 –$1.45
(g) Grade C fuel	$0.85 –$0.90	$0.70 –$0.75
Cased Goods: (Per case)		
U. S. M.	$1.45 –$1.55	$1.45 –$1.55
400 e.p. blend, under 65 oct.	$1.50 –$1.60	$1.50 –$1.60
375-400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
(d) 40-43 grav., w.w. kero	$1.40 –$1.50	$1.40 –$1.50
Kero., p.w.	$1.35 –$1.45	$1.35 –$1.45

New York Export Quotations

(Cents per gal. in bbls. FAS New York)

CYLINDER OILS (Penna. Products)

Bright stock:		
Light, 25 p.t.	(p) 39.00–40.00	(p) 39.00–43.00
Neutral oil:		
200 3 color, 25 p.t.	(n)39.00	(n)39.00
150 3 color, 25 p.t.	(p) 37.00–40.00	(p) 37.00–39.50
600 s.r., unfilt	(p) 23.00–26.00	(p) 23.00–27.00
650 s.r., unfilt	(p) 25.00–29.00	(p) 25.00–30.00
600 fl. s.r.	(p) 26.50–30.00	(p) 26.50–31.50
630 fl., s.r.	(p) 31.50–34.00	(p) 31.50–36.00

Seaboard Wax Quotations

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, FAS, c.l. Domestic prices, FOB, refineries, in bags, c.l., with 0.2c discount allowed for shipment in bulk, except where noted. Scale solid; fully refined slabs in bags)

Prices Effective	Jan. 22	
	New York Domestic	New York Export
124-6 Y.C. scale	.....	(n)6.25
122-4 W.C. scale	.....	.....
124-6 W.C. scale	.....	(n)6.25
123-5 Fully rfd.	6.10 – 6.40	.....
125-7 Fully rfd.	6.10 – 6.55	(n)7.50
128-30 Fully rfd.	(h) 6.20 –6.75	(n)7.75
130-2 Fully rfd.	(h) 6.35 –7.00	(n)8.00
133-5 Fully rfd.	(p)6.65 –7.30	(n)8.50
135-7 Fully rfd.	(h&p)6.90-7.55	(n)9.00
108-111 white Match wax	.....	(n&t)7.00
		New Orleans Export
124-6 Y.C. scale		(n)6.25
122-4 W.C. scale		.....
124-6 W.C. scale		(p) 6.25 –6.50
123-5 Fully rfd.		.....
125-7 Fully rfd.		(n)7.50
128-30 Fully rfd.		(n)7.75
130-2 Fully rfd.		(n)8.00
133-5 Fully rfd.		(n)8.50
135-7 Fully rfd.		(n)9.00

Gulf Coast Bulk

(FOB ship at Gulf for domestic and export; min. 20,000 bbls.)

Prices quoted by individual GCRA refiners on their products meeting GCRA specifications follow:

Jan. 22

GCRA Spec. Motor Fuels	
65 octane (CFR) unleaded	5.75 – 6.00
68 octane (CFR) unleaded	5.875 – 6.25
70 octane (CFR) unleaded	(p) 5.875–6.25
72-74 octane (CFR) unleaded	.....
72-74 octane (CFR) leaded	6.00 – 6.25
GCRA Spec. Kerosine & Gas Oils	
Kerosine	(p) 4.25 –4.375
43 or below diesel index gas oil	(n)4.00
43-47 diesel index gas oil	(p) 4.00 –4.125
48-52 diesel index gas oil	(p)4.25
53-57 diesel index gas oil	(p)4.375
58 & above	(p)4.50

Prices quoted by refiners for other products follow:

MOTOR GASOLINE

Jan. 22

	60-62 Gravity, 400 e.p.	61-63 Gravity, 390 e.p.	64-66 Gravity, 375 e.p.
60 oct. unleaded	5.25-5.50 (p)	5.25-5.375 (p)	5.375-5.50
65 oct. unleaded	5.50-6.00 (p)	5.50-5.625 (p)	5.625-5.75
68 oct. unleaded	5.75-6.25 (p)	5.875-6.00 (p)	6.00
70 oct. unleaded	(p)5.875-6.25	(n)6.125	(n)6.25
72-74 oct. leaded	5.75-6.25	(n)6.00	(n)6.00

KEROSINE

	Jan. 22	Jan. 15
41-43 grav. w.w.	4.25 – 4.50	4.25 – 4.50

GAS OILS

Gas Oil (i):		
Below 43 diesel index	(n)4.00	(n)4.00
43-47 diesel index	(n)4.125	(n)4.125
48-52 diesel index	4.00 – 4.25	4.00 – 4.25
53-57 diesel index	(p)4.375	(p)4.375
58 & above	(n)4.50	(n)4.50

LIGHT FUEL OILS

No. 2	(p) 4.00 –4.125	(p) 4.00 –4.125

DIESEL and BUNKER OILS

(c) Diesel Oil	$1.70	$1.70
(c) Grade C bunker oil	$0.90 –$1.00	$0.90 –$1.00
Grade C bunker oil, cargoes	$0.97 –$1.05	$0.95 –$1.00

MID-CONTINENT LUBES

(Cents per gal. at Gulf; in packages, FAS.; in bulk FOB terminals)

Jan. 22

	(v) Packages	Bulk
200 vis. D. 210 brt. stock	(n)36.50	(n)30.80
200 vis. E 210 brt. stock	(p)40.00	(p)34.00
150 vis. D 210 brt. stock 0-10 p.p.	(p) 32.50–34.00	(p) 26.80–28.00
10-25 p.p.	(p) 31.50–33.00	(p) 25.80–27.00
150 vis. E 210 brt. stock	(n)31.50	(n)25.80
100 vis. D 210 brt. stock 0-10 p.p.	(n)31.50	(n)25.80
10-25 p.p.	(n)30.50	(n)24.80
200 vis. No. 3 col. neutral: 0-10 p.p.	(n)22.00	(n)16.30
10-25 p.p.	(n)21.50	(n)15.80
180 vis. No. 3 col. neutral: 0-10 p.p.	(n)21.50	(n)15.80
10-25 p.p.	(n)21.00	(n)15.30

SOUTH TEXAS LUBES

(Vis. at 100° cold test 0, bulk export shipment, FOB terminals.)

Unfiltered Pale Oils:	Jan. 22	Jan. 15
Vis. Color		
100 No. 3	6.00 – 6.50	6.00 – 6.50
200 No. 3	7.50 – 8.50	7.50 – 8.50
300 No. 3	8.00 – 9.00	8.00 – 9.00
500 No. 3½	9.00 –10.50	9.00 –10.50
750 No. 4	9.50 –11.00	9.50 –11.00
1200 No. 4	10.00 –13.50	10.00 –13.50
2000 No. 4	10.25	10.25
Red Oils:		
Vis. Color		
100 No. 5-6	6.00 – 6.50	6.00 – 6.50
200 No. 5-6	7.50 – 8.50	7.50 – 8.50
300 No. 5-6	8.00 – 9.00	8.00 – 9.00
500 No. 5-6	9.00 –10.50	9.00 –10.50
750 No. 5-6	9.50 –11.00	9.50 –11.00
1200 No. 5-6	10.00 –13.50	10.00 –13.50
2000 No. 5-6	10.25	10.25

(a) In barge lots. (c) Ships' bunkers. Lighterage, additional at some points, not included. (d) 150 fire point. (e) For San Francisco cargo prices, add 5c per bbl. to cargo prices shown above. (f) Pacific Specification 200. (g) Pacific Specification 400. (h) Shipment in bags or in bulk. (i) Less than ½ of 1% sulfur. (j) Second-hand barrels. (k) Continental ports in range between Bordeaux and Hamburg, both inclusive. (l) Venezuela loading, same rate: Tampico, 2c to 3c per bbl. additional. (m) One supplier quoting. (n) One refiner quoting. (o) No quotations reported. (p) Two refiners quoting. (q) No rates reported. (r) Two suppliers quoting. (s) Sale. (t) Shipment in tight barrels. (v) New steel drums. (w) Last paid for mixed cargo. Full cargo fixture of No. 2 Fuel reported at 72c.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency
(Effective Jan. 1, 1940, except Corning Nov. 4, 1939)

Bradford-Allegany (Penna. and N. Y.) $2.75
Penna. Grade Oil in Southwest Penna. Pipe Lines $2.40
Penna. Grade Oil in Eureka Pipe Lines (West Virginia) $2.34
Corning Oil in Buckeye Pipe Lines (Ohio) .. $1.12

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective Jan. 1, 1940) $2.75
*The Pennzoil Co.: (Effective Jan. 1, 1940)
Penna. Grade Oil in National Transit Lines*$2.68
*The Pennzoil Co. posts $2.68 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields, prices in other lower districts range down to $2.63 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.
(Effective Oct. 9, 1939)

Midland, Midland County $1.02
Sherman $0.97
Clare-Freeman $0.97

Posted by Simrall Corp.
(Effective Oct. 9, 1939)

Crystal, Greendale, Porter, Vernon and Wise .. $1.02
Beaverton, Buckeye, Bentley, Edenville $1.00
Freeman and Redding $0.97
Arenac $0.82
(Effective Nov. 1, 1939)
West Branch $0.85

Posted by Sohio Corp. (Michigan Division)
(Effective Oct. 9, 1939)
Allegan and Kent Counties $1.03
(Effective Nov. 9, 1939)
Van Buren County $1.03

Posted by Bay Pipe Line Corp.
(Effective Oct. 9, 1939)
Bentley and Buckeye $1.00
Saginaw and Wise .. $1.02 Clare $0.76

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.
(Effective June 8, 1939)
Illinois and Western Indiana $0.95
Illinois Basin $1.05

Posted by Sohio Corp.
Illinois Basin:
(Effective Oct. 21, 1939)
Salem (Lake Centralia) $1.05
(Effective June 8, 1939)
Balance of Illinois Basin $1.05
(Effective Oct. 10, 1939)
Griffin (Ind.) pool, sand wells $0.95
Griffin (Ind.) pool, McCloskey lime $0.85

Posted by Carter Oil Co.
(Effective June 10, 1939)
Louden, Fayette County, Ill. $1.05

Posted by Ashland Oil & Transportation Co.
(Effective June 9, 1939)
Somerset Oil in Ashland Lines, Kentucky:
Big Sandy River .. $1.02 Kentucky River .. $1.10

Western Kentucky
Posted by Sohio Corp.
(Effective June 9, 1939)
Birk City Area $0.90

Posted by Owensboro-Ashland Co.
Owensboro Area $1.00
Corydon Area (Henderson) $0.90

CANADIAN FIELDS

Posted by Imperial Oil Limited
Western Ontario
(Effective Nov. 6, 1939)
Petrolia ..... $2.10 Oil Springs $2.17
Alberta Turner Valley
(Prices f.o.b. field tankage)
(Effective Jan. 5, 1938)

Crude Oil			
40-40.9°	$1.14	53-53.9	$1.40
41-41.9	1.16	54-54.9	1.42
42-42.9	1.18	55-55.9	1.44
43-43.9	1.20	56-56.9	1.46
44-44.9	1.22	57-57.9	1.48
45-45.9	1.24	58-58.9	1.50
46-46.9	1.26	59-59.9	1.52
47-47.9	1.28	60-60.9	1.54
48-48.9	1.30	61-61.9	1.56
49-49.9	1.32	62-62.9	1.58
50-50.9	1.34	63-63.9	1.60
51-51.9	1.36	64-64.9	1.62
52-52.9	1.38		

Crude Naphtha, 65 grav. & above $2.14
Absorption Gasoline
90% Rec., 20 lb. Reid v.p. $1.94
90% Rec., 17 lb. Reid v.p. $2.08

MID-CONTINENT—Oklahoma-Kansas

*(For effective dates, see footnote)

	S. O. Indiana	Carter Mag-nolia Shell	Conti-nental Texas Co.	Sin-clair Prairie
Below 21°	$0.70	$0.60	....	....
21-21.9	.72	.63	....	....
22-22.9	.74	.66	....	....
23-23.9	.76	.69	....	....
24-24.9	.78	.72	....	....
25-25.9	.80	.75	....	$0.58
26-26.9	.82	.78	....	.63
27-27.9	.84	.81	....	.68
28-28.9	.86	.84	$0.86	.73
29-29.9	.88	.87	.88	.78
30-30.9	.90	.90	.90	.82
31-31.9	.92	.92	.92	.86
32-32.9	.94	.94	.94	.90
33-33.9	.96	.96	.96	.96
34-34.9	.98	.98	.98	.98
35-35.9	1.00	1.00	1.00	1.00
36-36.9	1.02	1.02	1.02	1.02
37-37.9	1.04	1.04	1.04	1.04
38-38.9	1.06	1.06	1.06	1.06
39-39.9	1.08	1.08	1.08	1.08
40 & above	1.10	1.10	1.10	1.10

*Effective in 1938 by Carter Oil, Oct. 13, posting in Okla. only; Continental Oil, Oct. 11, with lowest grade below 29; Magnolia, Oct. 12, posting in Okla. only; Shell, Oct. 22; S. O. Indiana, Oct. 17; The Texas Co., Oct. 12. Aug. 31, 1939, by Sinclair-Prairie.

North-North Central and Central Texas
*(For effective dates, see footnote)

	Stano-lind	Sinclair Texas Co. Conti-nental Magnolia
Below 21°	$0.60	....
21-21.9	.62	....
22-22.9	.64	....
23-23.9	.66	....
24-24.9	.68	$0.79
25-25.9	.70	for
26-26.9	.72	oil
27-27.9	.74	below
28-28.9	.76	29°.
29-29.9	.78	.81
30-30.9	.80	.83
31-31.9	.82	.85
32-32.9	.84	.87
33-33.9	.86	.89
34-34.9	.88	.91
35-35.9	.90	.93
36-36.9	.92	.95
37-37.9	.94	.97
38-38.9	.96	.99
39-39.9	.98	1.01
40 & above	1.00	1.03

*Effective Oct. 11, 1938 by Continental, in North Tex.; Oct. 12, 1938, by Texas Co. in North & North Central Texas. Texas Co.'s lowest grade is 28-28.9, at $0.79; by Magnolia, Dec. 3, 1938, in N. and N. Central Texas; Oct. 5, 1939 by Sinclair Prairie in Mexia and N. Cent. Texas.

Jefferson County, Texas—Beaumont

(Posted by Magnolia Petroleum Co., Effective Oct. 2, 1939, and by Stanolind Oil & Gas Co., for West Beaumont, Effective Oct. 2, 1939)

Below 20°	$0.86	30-30.9	$1.08
20-20.9	.88	31-31.9	1.10
21-21.9	.90	32-32.9	1.12
22-22.9	.92	33-33.9	1.14
23-23.9	.94	34-34.9	1.16
24-24.9	.96	35-35.9	1.18
25-25.9	.98	36-36.9	1.20
26-26.9	1.00	37-37.9	1.22
27-27.9	1.02	38-38.9	1.24
28-28.9	1.04	39-39.9	1.26
29-29.9	1.06	40 & above	1.28

TEXAS FIELDS

Posted by Humble Oil & Refining Co.
West Central Texas
(Effective Aug. 11, 1939)

24-24.9	$0.71	33-33.9	$0.89
25-25.9	.73	34-34.9	.91
26-26.9	.75	35-35.9	.93
27-27.9	.77	36-36.9	.95
28-28.9	.79	37-37.9	.97
29-29.9	.81	38-38.9	.99
30-30.9	.83	39-39.9	1.01
31-31.9	.85	40 & above	1.03
32-32.9	.87		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young Counties.

Effective Aug. 29, 1939, Shell posted in Fisher county, Tex., prices 3c lower than Humble's West Central Texas prices; Shell's schedule begins with below 25, at $0.68 and ends with 40 & above, at $1.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

East Central Texas
(Effective Aug. 11, 1939)

23-23.9	$0.78	32-32.9	$0.96
24-24.9	.80	33-33.9	.98
25-25.9	.82	34-34.9	1.00
26-26.9	.84	35-35.9	1.02
27-27.9	.86	36-36.9	1.04
28-28.9	.88	37-37.9	1.06
29-29.9	.90	38-38.9	1.08
30-30.9	.92	39-39.9	1.10
31-31.9	.94	40 and above	1.12

Posted by Pan American Pipe Line Co.
(Effective Oct. 2, 1939)
Cayuga, Anderson county $0.78
*Including Anderson, Cherokee, Limestone, Navarro counties.

PANHANDLE TEXAS

	Humble (Aug. 11, 1939)		Texas Co. (Oct. 2, 1939)	
	Gray County	Carson Hutchin-son	Sweet	Sour
28-28.9	$0.72	$0.67	....	....
29-29.9	.74	.69	....	....
30-30.9	.76	.71	....	....
31-31.9	.78	.73	....	....
32-32.9	.80	.75	....	....
33-33.9	.82	.77	....	....
34-34.9	.84	.79	$0.84	$0.79
35-35.9	.86	.81	.86	.81
36-36.9	.88	.83	.88	.83
37-37.9	.90	.85	.90	.85
38-38.9	.92	.87	.92	.87
39-39.9	.94	.89	.94	.89
40 & above	.96	.91	.96	.91

Effective Aug. 31, 1939, Sinclair Prairie met Humble in Panhandle Texas. Dec. 3, 1938, Magnolia posted same schedule as Humble.

*EAST TEXAS

By Humble, Shell, Sinclair-Prairie, Stanolind, Gulf, Magnolia, Texas Co., Tide Water-Associated $1.10
*Effective dates: Aug. 11, 1939, by Humble and Tide Water-Associated; Aug. 29, 1939, by Stanolind; Oct. 2, 1939 by Sinclair Prairie; Oct. 5, 1939 by Shell; Oct. 12, 1938, by Magnolia, Texas Co.; Oct. 13, 1938, by Gulf.

*Includes Cherokee, Gregg, Rusk, Smith and Upshur counties.

Posted by Shell Oil Co., Inc.
(Effective Oct. 5, 1939)
Polk County, Tex. (Livingston and Schwab-Wilcox areas) $1.10

NORTHEAST TEXAS

(Posted by Humble, Oct. 2, 1939)
Talco $0.65

(Posted by Magnolia, Oct. 12, 1938)
Cass County and Panola County, Tex.:
Magnolia posts below 25° at $0.73, plus 2c differential for each degree, to top grade of 40 & above, at $1.05.

(Posted by The Texas Co., Oct. 12, 1938)
Cass County $1.05

WEST TEXAS and NEW MEXICO

(a) (For effective dates, see footnote)

	Humble	Stano-lind	Shell	Texas Co. Sinclair (c)
Below 20°	$0.53	....	$0.53	....
20-20.9	.55	....	.55	....
21-21.9	.57	....	.57	....
22-22.9	.59	$0.67	.59	....
23-23.9	.61	for	.61	....
24-24.9	.63	oil	.63	....
25-25.9	.65	Below	.65	$0.65
26-26.9	.67	26°.	.67	.67
27-27.9	.69	.69	.69	.69
28-28.9	.71	.71	.71	.71
29-29.9	.73	.73	.73	.73
30-30.9	.75	.75	.75	.75
31-31.9	.77	.77	.77	.77
32-32.9	.79	.79	.79	.79
33-33.9	.81	.81	.81	.81
34-34.9	.83	.83	.83	.83
35-35.9	.85	.85	.85	.85
36-36.9	.87	.87	.87	.87
37-37.9	.89	.89	for	for
38-38.9	.91	.91	oil	oil
39-39.9	.93	.93	36° &	36° &
40 & above	.95	.95	above.	above.

Posted by Magnolia Petroleum Co.
(Effective Oct. 12, 1938 in West Texas; Oct. 15, 1939 in Lea County, N. Mex.)

	West Texas	N. Mex.		West Texas	N. Mex.
Below 25	$0.63	$0.63	33-33.9	$0.81	$0.81
25-25.9	.65	.65	34-34.9	.83	.83
26-26.9	.67	.67	35-35.9	.85	.85
27-27.9	.69	.69	36-36.9	.87	.87
28-28.9	.71	.71	37-37.9	.89	for
29-29.9	.73	.73	38-38.9	.91	oil
30-30.9	.75	.75	39-39.9	.93	36 &
31-31.9	.77	.77	40 & over.	.95	above
32-32.9	.79	.79			

Note: Magnolia's West Texas postings are in Crane, Glasscock, Howard, Mitchell, Upton and Winkler counties.

Pecos County, West Texas
(Posted by Humble Aug. 11, 1939 and Shell, Aug. 29 '39)
Pecos $0.78
Yates Shallow Pool (Shell only) ..... .65

Posted by Sinclair Prairie Oil Marketing Co.
(Effective Aug. 31, 1939)
Eddy county, N. Mex. $0.77
(a) Effective Aug. 11, 1939 by Humble; Shell Oil, Aug. 29, 1939; by The Texas Co., Oct. 12, 1938; Stanolind, Aug. 29, 1939; Sinclair Prairie, Aug. 31, 1939.
(c) Texas Co. posts $0.65 for below 26; Sinclair Prairie, $0.63 for below 25.

Note: Humble's postings are in these counties: Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler and Yoakum, West Texas; and Lea county, N. Mex.; Shell, in Crane, Ector, Glasscock, Howard, Upton, Winkler, Yoakum, Lea; Stanolind in Hendrick and Henderson field, Winkler county; Texas Co. in Ward, Winkler and Lea.

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)
Artesia, Jackson and Maljamar pools, New Mexico; gravity schedule beginning with below 29, at $0.61; 29-29.9, at $0.63; plus 2c differential for each gravity, up to 40 & above, at $0.85.

COLORADO

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)
Ft. Collins and Wellington

Below 29	$0.81	35-35.9	$0.95
29-29.9	.83	36-36.9	.97
30-30.9	.85	37-37.9	.99
31-31.9	.87	38-38.9	1.01
32-32.9	.89	39-39.9	1.03
33-33.9	.91	40 & above	1.05
34-34.9	.93		

Canon City and Florence, Col. $0.90

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.
(Effective Aug. 11, 1939)
Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski crudes $0.96
Van crude $0.93
Conroe $1.27
(Effective Oct. 2, 1939)
Flour Bluff and Jim Wells County $1.23
(Effective Sept. 14, 1939)
Hardin, Liberty county $1.10
Oct. 12, '38, Magnolia posted $0.96 in Darst Creek; $0.87 in Luling; $0.99 in Lytton Springs; $1.14 for Cleveland, and $1.02 in Hardin, both in Liberty county, Tex.
Oct. 12, '38, The Texas Co. posted $0.96 in Darst Creek.

CRUDE OIL MARKETS

(Continued from preceding page)

***Anahuac-Dickinson**
(Effective Oct. 2, 1939)

Below 20°	$0.81	30-30.9	$1.03
20-20.9	.83	31-31.9	1.05
21-21.9	.85	32-32.9	1.07
22-22.9	.87	33-33.9	1.09
23-23.9	.89	34-34.9	1.11
24-24.9	.91	35-35.9	1.13
25-25.9	.93	36-36.9	1.15
26-26.9	.95	37-37.9	1.17
27-27.9	.97	38-38.9	1.19
28-28.9	.99	39-39.9	1.21
29-29.9	1.01	40 & above	1.23

*Anahuac-Dickinson includes Cedar Point, Fairbanks, Gillock, Hull, Pierce Junction and Raccoon Bend (shallow sand) and Turtle Bay.

Raccoon Bend (Deep sand crude) Tomball and Satsuma
(Effective Aug. 11, 1939)

22-22.9	$0.95	32-32.9	$1.15
23-23.9	.97	33-33.9	1.17
24-24.9	.99	34-34.9	1.19
25-25.9	1.01	35-35.9	1.21
26-26.9	1.03	36-36.9	1.23
27-27.9	1.05	37-37.9	1.25
28-28.9	1.07	38-38.9	1.27
29-29.9	1.09	39-39.9	1.29
30-30.9	1.11	40 & above	1.31
31-31.9	1.13		

Dec. 3, 1938, Magnolia posted above price and gravity schedule in Tomball. Effective Aug. 29, 1939, Stanolind met Humble in Tomball, except that Stanolind's schedule begins with below 29 at $1.07.

LOUISIANA-ARKANSAS
Posted by Standard Oil Co. of Louisiana
(†) (For effective dates, see footnote)

	*N. La. Ark. Sweet	Bunkie Eola, La.	*South La. Sour	*Ark. Sour	Baton Rouge-University
Below 20°					$0.79
20-20.9	$0.73	$0.83	‡$0.74	$0.63	.82
21-21.9	for	for	.77	for	.85
22-22.9	oil	oil	.80	oil	.88
23-23.9	Below	Below	.83	Below	.91
24-24.9	25°.	25°.	.86	25°.	.94
25-25.9	.75	.85	.89	.65	.97
26-26.9	.77	.87	.92	.67	1.00
27-27.9	.79	.89	.94	.69	1.02
28-28.9	.81	.91	.96	.71	1.04
29-29.9	.83	.93	.98	.73	1.06
30-30.9	.85	.95	1.00	.75	1.08
31-31.9	.87	.97	1.02	.77	1.10
32-32.9	.89	.99	1.04	.79	1.12
33-33.9	.91	1.01	1.06	.81	1.14
34-34.9	.93	1.03	1.08	.83	1.16
35-35.9	.95	1.05	1.10	.85	1.18
36-36.9	.97	1.07	1.12	.87	1.20
37-37.9	.99	1.09	1.14	.89	1.22
38-38.9	1.01	1.11	1.16	.91	1.24
39-39.9	1.03	1.13	1.18	.93	1.26
40 & above	1.05	1.15	1.20	.95	1.28

(Effective Aug. 30, 1939)

Smackover, Ark.	$0.73
Cotton Valley Distillate	$1.20

*N. La.-Ark. Sweet includes Caddo, Cotton Valley, Cross Lake, De Soto, Haynesville, Homer, Rodessa, Sabine and Sligo, La. crudes, and Miller county, Ark. S. La. Sour includes Choctaw, Darrow, N. Crowley, Roanoke and St. Martinsville. S. Ark. Sour includes Buchner, Magnolia and Village pools.

†N. La.-Ark. Sweet crude and S. La. Sour effective Aug. 30, 1939, except Cross Lake, La., Sept. 7, Baton Rouge-Univ., Sept. 11, and Bunkie and Eola, Oct. 23, 1939; and Ark. Sour, Sept. 13, 1939.

‡For Below 21°.

Effective Sept. 8, 1939, Gulf Refg. Co. met S. O. La's. N. La.-Ark. Sweet prices in Bull Bayou, Caddo, Crichton, De Soto, Haynesville, Homer, and El Dorado

Posted by Arkansas Fuel Oil Corp.
(Effective Jan. 28, 1937)

Urania, La.	$1.02

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Tepetate and Ville Platte, La.	$1.03

(Effective Jan. 1, 1939)

Abbeville, La.

Below 36	$0.92	38-38.9	$0.98
36-36.9	.94	39-39.9	1.00
37-37.9	.96	40 & above	1.02

Posted by Caddo Crude Oil Purchasing Corp.
(Effective Aug. 14, 1939)

Allison area, Shreveport field	$0.95

Lisbon, N. La.
(Effective Sept. 14, 1939)

27-27.9	$0.66	32-32.9	$0.76
28-28.9	.68	33-33.9	.78
29-29.9	.70	34-34.9	.80
30-30.9	.72	35 & above	.82
31-31.9	.74		

Lisbon prices met by Gulf, Sept. 14.

Note: S. O. Louisiana prices in all La.-Ark. fields, effective Oct. 5, 1938, are on 100% tank table basis.

GULF COASTAL FIELDS
(a) (For effective dates, see footnote)

	Continental Humble Sinclair Stanolind	Refugio Crude (Humble, Continental)	Texas Co.	Shell
Below 20	$0.86	$0.91	$0.86	(b)$0.79
20-20.9	.88	.93	.88	.81
21-21.9	.90	.95	.90	.83
22-22.9	.92	.97	.92	.86
23-23.9	.94	.99	.94	.89
24-24.9	.96	1.01	.96	.92
25-25.9	.98	1.03	.98	.95
26-26.9	1.00	1.05	1.00	.98
27-27.9	1.02	1.07	1.02	1.00
28-28.9	1.04	1.09	1.04	1.02
29-29.9	1.06	1.11	1.06	1.04
30-30.9	1.08	1.13	1.08	1.06
31-31.9	1.10	1.15	1.10	1.08
32-32.9	1.12	1.17	1.12	1.10
33-33.9	1.14	1.19	1.14	1.12
3 -34.9	1.16	1.21	1.16	1.14

(Continued in next column)

35-35.9	1.18	1.23	for	for
36-36.9	1.20	1.25	oil	oil
37-37.9	1.22	1.27	34° &	34° &
38-38.9	1.24	1.29	above.	above.
39-39.9	1.26	1.31		
40 & above	1.28	1.33		

(a) Effective Oct. 2, 1939 by Continental, Humble and Texas Co.; Oct. 3, 1939 by Sinclair and Stanolind; Aug. 29, 1939 by Shell. Stanolind's lowest grade is below 21, at $0.88. Refugio, effective Oct. 2, '39 by Humble.

(b) Shell posts these prices in Iowa district, Black Bayou and White Castle, La.; prices in Iowa district have 2 lower grades: below 18, at $0.75, 18-18.9, $0.77; and 19-19.9, is $0.79.

Note: Humble's Gulf Coast prices apply in these Texas fields: Amelia, Clear Lake, Goose Creek, Mirando which includes Duval, Jim Hogg, Webb and Zapata counties and Heyser and Placedo fields; Mykawa, Sugarland, Thompsons and Webster.

Humble's prices in Refugio include crudes purchased in Saxet, East White Point, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor fields.

Stanolind's prices apply in High Island and Spindletop; also in Clinton, Hastings and South Houston, where, effective Jan. 1, 1940, lowest grade is below 21° at $0.88; rest of schedule same as other Gulf Coast. Magnolia posts Mirando, effective Oct. 2, same prices as Humble. Texas Co.'s prices are in Texas and La., Gulf Coast; its prices on Refugio are same as Humble's up to 28 gravity; 28 & above, $1.09; on Duval-Mirando same as Humble's up to 28; 28 & above, $1.04; it p sts Golden Meadow, La., 24-30 grav., $0.90, plus 2c differential, to 40 & above, $1.10.

Posted by Shell Oil Co., Inc.
(Effective Aug. 29, 1939)

Gibson field, Terreborne Parish, La.	$1.04

ROCKY MOUNTAIN FIELDS
Posted by Stanolind Oil & Gas Co.
(Effective Oct. 11, 1938)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma-Kansas, ranging from $0.86 to $1.10, which see under Mid-Continent crude on previous page.

Tensleep, Salt Creek field	$0.646
Iles, heavy	0.92
Elk Basin, light	0.90
Grass Creek, light	0.90
Frannie light	0.55
Grass Creek, heavy	0.40
Hamilton Dome, Wyo.	0.35
Frannie heavy	0.42

Posted by Ohio Oil Co.
(Effective Oct. 11, 1938)

Elk Basin, Wyo.	$0.90	Rock Creek	1.00
Grass Creek, light	0.90	Lance Creek	0.77
Dry Creek, Mont.			0.92

(Effective May 1, 1938)

Grass Creek, heavy	$0.50

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Cat Creek, Mont.	$1.10
Big Muddy, Wyo.	0.98
Lance Creek, Wyo.	0.77

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, July 9, 1938; Montebello, Aug. 11, 1939. Coles Levee-Richfield Western, Oct. 1, 1939.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Mountain View ‡Newhall and others	Elk Hills	Buena Vista Hill Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hills	Coalinga	Wheeler Ridge	Coles-Levee Richfield Western	Santa Maria Val. (Union Oil, Sept. 1 '39)
14-14.9	$0.80	$0.79	$0.74	$0.78	$0.79	$0.80	$0.76			$0.80	$0.76	$0.76	$0.77	$0.78		$0.70	$0.70	$0.70		$0.70	$0.70			$0.42
15-15.9	.80	.79	.74	.78	.79	.80	.76			.80	.76	.76	.77	.78		.70	.70	.70		.70	.70			.44
16-16.9	.80	.79	.74	.78	.79	.80	.76			.80	.76	.76	.77	.78		.70	.70	.70		.70	.70			.45
17-17.9	.80	.79	.74	.78	.81	.80	.76			.80	.76	.76	.77	.78		.70	.70	.70		.70	.70			.46
18-18.9	.80	.79	.74	.78	.84	.80	.78			.82	.76	.76	.77	.78		.70	.70	.70		.70	.70			
19-19.9	.82	.79	.74	.82	.87	.84	.81			.85	.76	.78	.77	.78		.70	.74	.74		.74	.71	.70		
20-20.9	.85	.79	.74	.85	.90	.88	.84			.88	.78	.82	.77	.80		.70	.78	.78		.78	.72	.70		
21-21.9	.88	.79	.74	.89	.93	.93	.88			.91	.80	.85	.77	.84	.78	.73	.82	.82		.82	.74	.70		
22-22.9	.92	.82	.74	.92	.96	.98	.92			.93	.84	.89	.79	.88	.78	.77	.87	.87		.86	.78	.72		
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	.80	.92	.92		.90	.82	.76		
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	.84	.97	.97		.94	.86	.79		
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	.88	1.01	1.01	....	.98	.90	.83		
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.93	1.03	.90	.91	1.06	1.06	1.02	....	....	....		
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.97	1.06	.95	.95	1.10	1.10	$0.91	1.06	....	....	$1.00	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	1.01	1.10	.99	.99	1.15	1.15	.94	1.10	....	....	1.03	....
29-29.9	1.17	1.15	.93	1.18	1.18	....	1.17	1.12	.93	....	1.09	....	1.06	1.14	1.03	1.02	1.20	1.20	.98	1.14	....	....	1.06	....
30-30.9	1.21	1.19	.95	1.22	1.21	....	1.21	1.17	.95	....	....	....	1.10	1.17	1.08	1.06	1.25	1.25	1.02	1.18	....	....	1.09	....
31-31.9					1.24	....	1.24	1.22	.97	....	....	....	1.14	1.21	1.12	1.09	1.29	1.29	1.06				1.13	....
32-32.9		*Elwood Terrace			1.27	....	1.27	1.27	1.00	....	....	....	1.18	1.25	1.16	1.13	1.34	1.34	1.09	Kettleman Hills			1.16	....
33-33.9		1.28				....	....	1.32		....	....	....	1.22	1.28	1.20	1.17	1.38	1.38	1.13	....	1.19	....	1.19	....
34-34.9		1.32				....	....	1.37		....	....	....	1.26	1.32	1.25	1.20	....	....	1.17	....	1.23	....	1.22	....
35-35.9		1.35				....	....	1.42		....	....	....	1.30	....	1.29	....	....	....	1.20	....	1.27	....	1.26	....
36-36.9		1.39				....	....	1.46		....	....	....	1.34	....	1.33	....	....	....	1.24	....	1.31	....	1.29	....
37-37.9		1.43				....	....	1.51		....	....	....	1.38	....	1.37	....	....	....	1.28	....	1.35	....	1.32	....
38-38.9						....	....	1.56		....	....	....	1.42	....	1.42	....	....	....	1.31	....	1.39	....	1.35	....
39-39.9						F.O.B. Standard Pipe Line	....	1.61		....	....	....	1.47	....	....	....	....	....	1.35	....	1.43	....	1.39	....
40-40.9						....	....	1.66		....	....	....	1.51	....	....	....	....	....	1.39	....	....	....	1.42	....
41-41.9						....	....	....		....	....	....	1.55	....	....	....	....	....	1.43	....	....	....	1.45	....
42-42.9						....	....	....		....	....	....	1.59	....	....	....	....	....	1.46	....	....	....	1.48	....
43-43.9						....	....	....		....	....	....	1.63	....	....	....	....	....	1.50	....	....	....	1.51	....
44-44.9						....	....	....		....	....	....	1.67	....	....	....	....	....	1.54	....	....	....	1.55	....
45-45.9						....	....	....		....	....	....	1.71	....	....	....	....	....	1.57	....	....	....	1.58	....
46-46.9						....	....	....		....	....	....	1.75	....	....	....	....	....	1.61	....	....	....	1.61	....
47-47.9						....	....	....		....	....	....	....	....	....	....	....	....	1.65	....	....	....	....	....
48-48.9						....	....	....		....	....	....	....	....	....	....	....	....	1.68	....	....	....	....	....

*F. o. b. ship.

‡Mountain View postings begin at $0.70 for 19-19.9; Newhall and others, which include McKittrick, Kern River, Kern Front and Round Mountain begin with 14-14.9 and end with 19-19.9, all posted at $0.70.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Mid-Continent

(*Continued from page* 38)

inclement weather. Refiners said "below-the-market offerings" were not as plentiful as they were earlier in January.

Wax prices were off 0.25c when one refiner reported reducing his quotation for 124-126 white crude scale to 6.50c. Another refiner reported unchanged quotation of 6.75c. No changes were reported in Mid-Continent or South Texas lube quotations.

California

LOS ANGELES, Jan. 20.—Anticipation of a drop from 5 to 10c a bbl. in posted prices of California crude, was indicated this week by one independent supplier, who said that large quantities of crude were available at quotations "below posted prices."

Quotations on third-structure gasoline, at independent racks, were said to have dropped 0.25c to 5.75c a gal.

Quotations on Bunker "C" fuel oil were said to be between $0.725 and $0.75 a bbl., the new prices posted by larger companies Jan. 1 being $0.75 a bbl.

Lack of space aboard ships was responsible for preventing sales of asphalt to Australia, according to one oilman, who also stated that the European war has injured West Coast foreign off-shore business in that there is a definite lack of tankers.

One supplier, interested in off-shore foreign shipments, reported an inquiry from the Chilean navy for Bunker "C" fuel oil. Quotations made were in the neighborhood of $0.75 a bbl., it was said. Japanese demands against contracts, much of which is crude oil, were reported to be "normal," despite the expiration of the commercial treaty between Nippon and the U. S., Jan. 26.

Fruehauf Celebrates Silver Anniversary

The 25th anniversary of the Fruehauf Trailer Co. of Detroit was celebrated Jan. 3-6, when members of its field organization met to learn its plans and objectives for 1940.

August C. Fruehauf, father of Harvey C. Fruehauf, now president, in 1893 had a blacksmith and wagon shop in Detroit, when the city had about 100,000 population. In 1914, when horse-drawn vehicles were still trucks' biggest competitors, Harvey Fruehauf saw the possibilities in the adaptation of the horse-and-wagon method of hauling to automotive vehicles, and the present Fruehauf Trailer Co. was formed.

Now the company has branches in many cities, directly employs 3000 persons and has under construction at its plant an addition representing an investment of $300,000. It produces about 60 per cent of the freight trailers built.

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"STRICTLY PERSONAL"

Eight of the 27 Tulsans recently awarded certificates by the Chamber of Commerce for outstanding civic service in 1939 are connected with the oil business. They are: **W. G. Skelly,** president of the company that bears his name; **Waite Phillips,** producer; **W. K. Warren,** president of the company bearing his name; **O. E. McClatchey,** Barnsdall Oil Corp.; **Mrs. M. F. Waters,** whose husband is member of Hanlon-Waters, Inc.; **Rush Greenslade,** Gulf Oil Corp.; **T. F. Birmingham,** president of Margay Oil Co.; and **Clay Tallman,** chief counsel for Stanolind Oil & Gas Co.

* * *

William J. Armstrong, state conservation officer for the past several years, has announced he is a candidate for corporation commissioner.

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At the annual meeting of the Western Asphalt Ass'n., held Jan. 17 in Los Angeles, the following officers and directors were elected: Officers—**J. R. Keane,** president; **J. R. Pemberton,** vice-president; **R. M. Blodget,** vice-president; **C. W. Powell,** treasurer; **H. P. Frackelton,** secretary-manager. Directors—**S. M. Griffith, C. W. Powell, A. F. Brough, G. R. Daley** (San Diego), **J. R. Keane.**

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D. K. Ludwig, president of American Tankers Co., and his bride of Darien, Conn., sailed this week from Los Angeles aboard the flagship Lurline, enroute to Hawaii.

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C. A. Johnson, of the Holly Oil Co., is now a vice-president, as well as a director, of the Oil Producers Agency of California.

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John E. Adams, geologist for Standard Oil Co. of Texas and stationed at Midland, Tex., has been elected president of the West Texas Geological Society. **Dana M. Secor,** district geologist for Skelly Oil Co., was named vice president, and **Fred F. Kotyza,** Tidewater Associated Oil Co. geologist, secretary and treasurer. The new officers succeed **Berte R. Haigh, W. C. Fritz** and **J. E. Simmons,** who held these respective offices.

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Twenty-six oil men of this city met recently to organize the Detroit Oil Men's Club whose obligations are defined as "pleasure, social recreation, charity, and the promotion of good fellowship." Headquarters are in the Detroit-Leland Hotel, Suite 959.

Early Hope, Petroleum Services, Inc., is president of the new club. **Russell W. McLean,** Red Indian Oil Co., is vice president, **Wray B. Bailey,** Wilson Oil Corp., is treasurer, and **Elmer E. Ledbetter,** Wayne Oil Co., is secretary.

On the Board of Directors are **Howard J. MacGready,** Aurora Gasoline Co., **J. A. Citrin,** Citrin-Kolb Oil Co., **Harry M. Rugg,** Pennsylvania Grade Crude Oil Assn., **C. F. Battenfeld,** Battenfeld Oil Co., and **Glenn E. Keister,** Shell Petroleum Corp.

Membership has already increased by 18 additional members and a number of additional applications are in the hands of the Membership committee. In a short time the membership is expected to be somewhere between 50 and 75. Much credit is given **Roi Buzette,** chairman of the membership committee, for the present rapid growth of the membership.

While anyone having some connection with the petroleum industry is eligible, "membership has so far been on invitation and generally limited to those in the wholesale marketing end of the business."

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R. T. Herndon, Los Angeles, vice-president of The Texas Co. of California, has been made a national sales executive and transferred to Texaco headquarters at New York. Mr. Herndon had been in charge of sales activities for Texas on the Pacific Coast since it entered this area 10 years ago. He is 44 years of age and will be one of the youngest executives ever appointed to eastern sales headquarters of the company.

R. T. Herndon

D. E. Beaton has been transferred from Texaco's Chicago office to succeed Mr. Herndon on the West Coast.

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H. I. Casteel, formerly with Pittsburgh law firm of Campbell, Wick, Houck & Thomas, has joined Republic Oil Co.'s main office at Pittsburgh.

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M. C. McGehee, Jr., president of the Texas Gulf Producing Co., Houston, Tex.,—and a bachelor—has wired $1000 to the physician who was in attendance at the birth of quadruplets born in a log cabin in Alabama last week.

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Walter McKee, who has lately been in the oil marketing business in Indianapolis, has become representative of the Republic Oil Co. of Pittsburgh in the state of Georgia. Mr. McKee has had more than 25 years' experience in the oil industry, most of which has been spent in wholesale marketing and sales management. For a number of years previously, he contacted oil marketers in this section of the south.

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Chalmette Petroleum Corp. announces the election of three new officers: **F. E. Holsten,** executive vice president; **John Vaccaro,** vice president, and **L. E. Vivien,** secretary-treasurer.

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J. M. McLaughlin, well known to Wisconsin oil men and former president of the Wisconsin Petroleum Ass'n. has been advanced to assistant general manager of Wadhams Oil Co., Milwaukee, division of Socony-Vacuum Oil Co., Inc.

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E. J. Bischoffberger, for the past year assistant to **J. M. Gardner,** vice-president, of Republic Oil Co. has been made manager of Republic's new terminal at Fayetteville, North Carolina.

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Mike Filz, Erie Oil Co., Sheboygan, Wis., is back home and much improved in health after fighting a "strep" infection at the Mayo Clinic at Rochester, Minn.